

The Mining Journal

LONDON, MARCH 21, 1958

Vol. 250. No. 6396.

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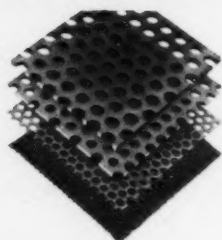
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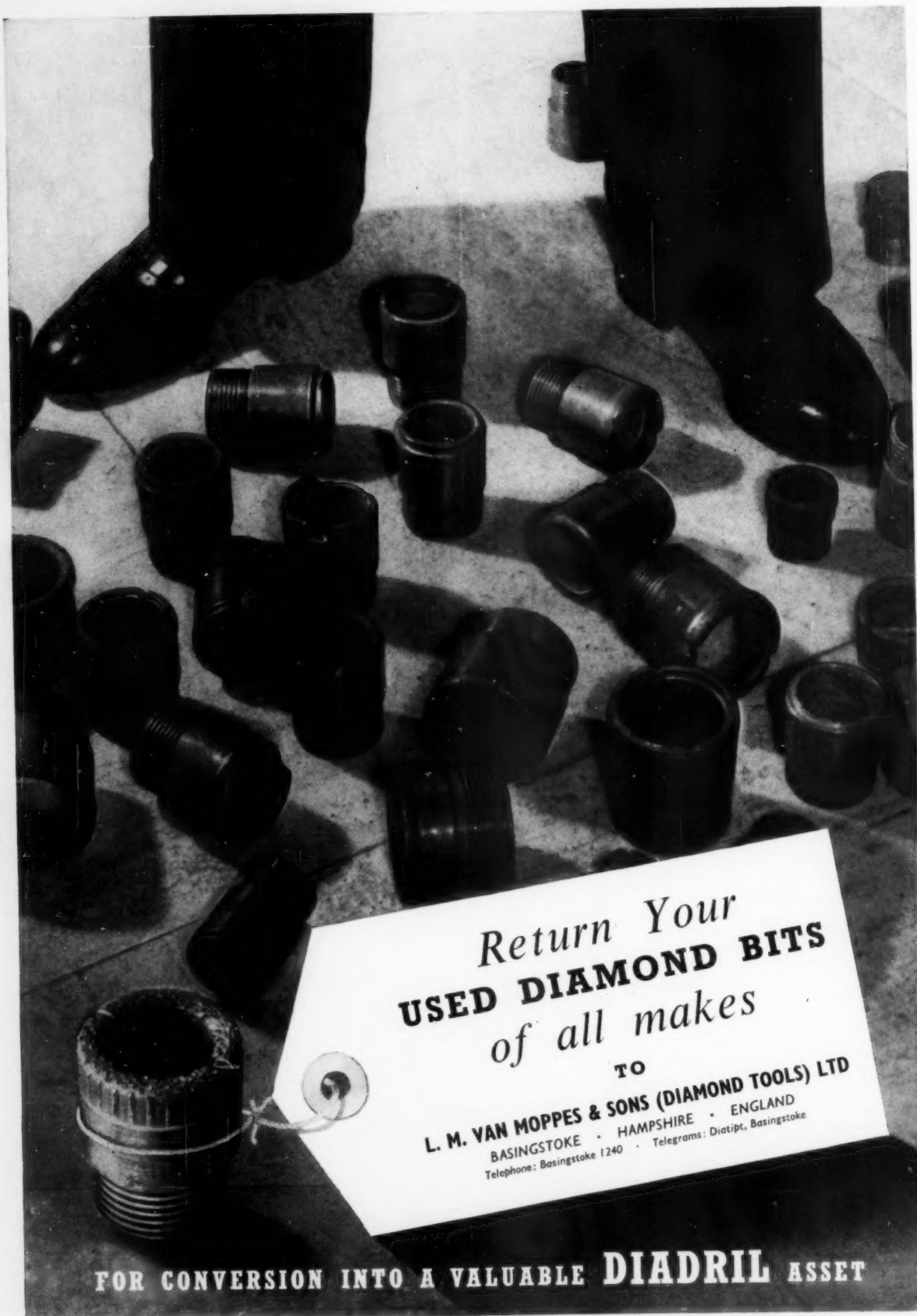


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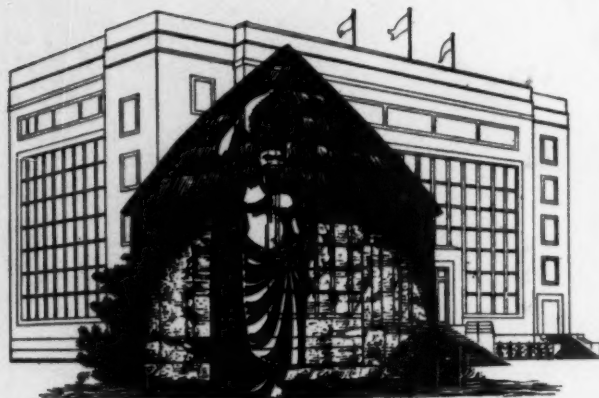


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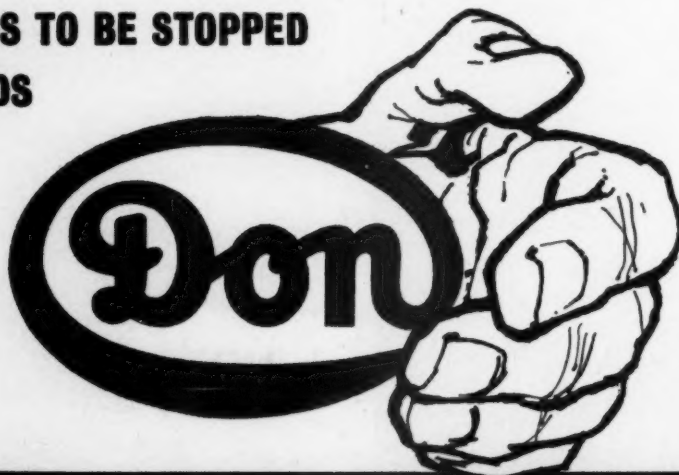
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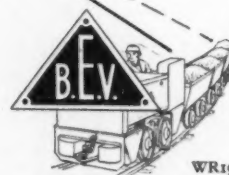
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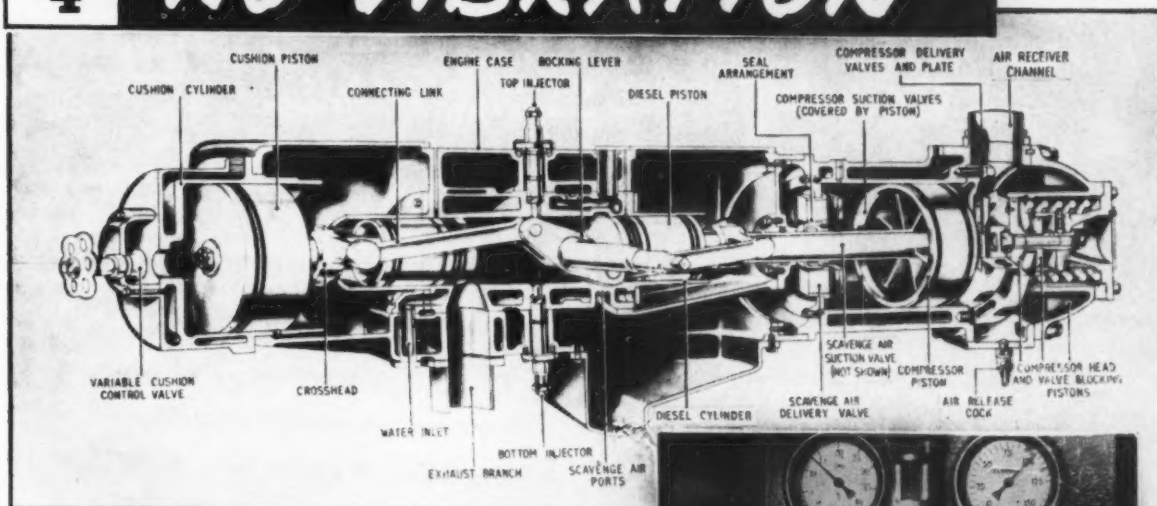
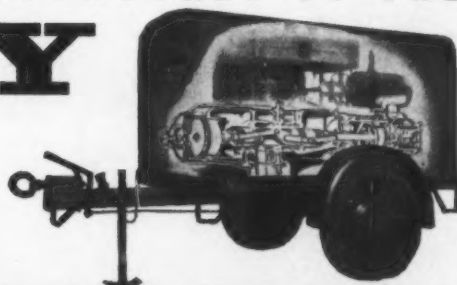
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The Mining Journal

London, March 21, 1958

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Vol. 250 No. 6396

Established 1835

Joint Editors

U. Baliol Scott R. Bruce Dunfield

News Editor

A. G. Thomson

Assistant Editor

R. Bowran

Display Advertisement Manager

E. S. Hooper

Circulation

Robert Budd

Published each Friday by

THE MINING JOURNAL LTD.

Directors

E. Baliol Scott
(Chairman)

G. A. Baliol Scott

U. Baliol Scott
(Managing)

R. A. Ellefsen

15, WILSON STREET,
LONDON, E.C.2

Telegraphic

Tutwork London

Telephone

MONarch 2567 (3 lines)

Annual Subscription £3

Single copy ninepence

Honeyman and After

A SINGLE theme has run through the surveys—now becoming considerable in number—that have been made in the post-war period into labour and general social problems on the Copperbelt. It is that, in these matters, the Copperbelt has tried to run before it can walk. A sophisticated apparatus of labour relations has been installed but its working does not appear, as yet, to have been fully mastered. The machinery has been safely imported but the makers' instructions do not seem always to have been followed. The formulation of new instructions now becomes a matter of increasing urgency as depression descends on the copper industry.

This is most apparent in the report of the Honeyman Commission, which enquired into the disturbances on the Copperbelt in July, 1957, and into the possibility of finding ways of avoiding, and quickly settling, disputes. The European Mineworkers' Union came out of the enquiry very badly. Possessed of immense powers it showed itself capable of breaking agreements and agreed procedures, incapable of insisting on strict adherence to its own rules, and liable to be stampeded by unofficial pressure groups within its membership.

At the same time, it is only fair to recognize two failings which have sometimes seemed to characterize the actions of the Chamber of Mines. The first is that the companies seem on occasion to have failed to distinguish between readiness to compromise and simple weakness of purpose. In its relations with the African union, leading up to the Brannigan Report, the Chamber had fallen over backwards in its desire to find an accommodation. Similarly, it is not reading too much between the lines of the Honeyman Report to say that it was precisely because the Chamber had been excessively tolerant towards the many small disputes between January, 1956, and July, 1957, that the European union decided that it could get away with the rockbreakers' refusal to work their full week.

The second fault follows naturally from the first. Having failed with the velvet glove the Chamber has sometimes put forward remedies before commissions of enquiry that in fact do it little credit and continue to give a totally false impression of the companies' general attitude to labour problems, which in reality is progressive and liberal. Thus, before the Honeyman Commission, the Chamber suggested that legislation be introduced rendering any participant in an illegal strike, or any trade union official supporting it, liable to penalties unless he could prove that he was not responsible in any way. In effect, under such legislation, an accused man would be guilty unless he could prove himself innocent, and the Commission rightly rejected it out of hand.

Of the fourteen strikes between January, 1956, and July, 1957, which led up to the Honeyman enquiry, all were found by the Commission to be unconstitutional, though in some the union officials did attempt to get the men back to work. Of two strikes, the report says that one should have led the union to discipline one of its own branch chairmen and that another brought little credit to the union officials and General Council.

Of the major dispute, the report says that the refusal of the rockbreakers to work their full week was a breach of the agreement but was not, in fact, a strike or a lockout, although "the major blame" rested with the union. On the subject matter of the dispute—whether it was feasible for rockbreakers to work a short Saturday shift—the Commission concluded that it was feasible but at a cost. Certainly there is no likelihood of the companies making such a concession at a time when the introduction of a five-day week is a not improbable contingency.

The main recommendations for the prevention of further disputes include the suggestion of legislation governing the closed shop subject to certain provisos. These include penalties for declaring strikes before negotiating machinery is exhausted, provision for appeal against suspension or expulsion, secret ballots with two-thirds majorities for strikes and lockouts and a ballot to decide whether a union really wants a closed shop. This last suggestion is intended to apply to unions already having a closed shop as well as to those which may be considering this development.

In fact, if any union showed itself unworthy to be trusted with the power that a closed shop provides it is surely the European union, and one is entitled to the gravest doubts as to whether the safeguards are adequate. Nor is it possible to be entirely happy about the findings on the secret ballot. If a secret ballot is required to start a strike it is surely also necessary to have one to end it.

The Chamber originally accepted the closed shop under duress and later tried to get it abolished. It remains to be seen whether it will now lose the final battle. The Northern Rhodesian Legislative Council is introducing legislation in its current session in line with the Honeyman recommendations.

In passing, it is interesting to note that the African union earned the commendation of the Commission for its correct behaviour during the disputes. The Commission made no recommendation on the African union's demands for a closed shop, but it did suggest that the check-off system should be restored—a recommendation which the Chamber put into effect this week with suitable safeguards relating to the publication of accounts and authorization of disbursements. This reward for good behaviour will give the union some reliable income. It undoubtedly marks an upturn in the African union's affairs, and if a proportion of the income is set aside for the training of union officials, then the African union may be on the way to becoming a well-organized and sober labour force.

With the Copperbelt now in a period of depression and with the margin between price and cost much too small for comfort (even if we assume that copper has grounded) all concerned should be co-operating for the good of the industry, the country and themselves. In fact, however, the Copperbelt is now going through one of its recurrent periods of strained labour relations, and it is perhaps unfortunate that legislation giving effect to the Honeyman recommendations should be before the Legislative Council just at this moment.

The union, having recently had its own internal administrative difficulties in addition to coming so badly out of the Honeyman enquiry, is to say the least, somewhat touchy and on the defensive. Consequently, its leaders are perhaps not in the best frame of mind to be able to view objectively the very reasonable arguments being put forward by the Chamber regarding the need for greater operational efficiency. The hard fact is, however, that the choice for the union lies between co-operation in cutting unit costs at the present level of operations and facing substantial redundancy.

The companies see the achievement of increased

efficiency largely as a matter of eliminating restrictive practices which have been allowed to grow up in a prolonged period of prosperity. (Incidentally, the companies have made it clear that there is no question of replacing European labour by Africans.) The union professes to insist that, if it is to collaborate in this, both it and its technical advisers must have full access to the mine's operating and cost data. The companies regard such information as being held on trust for the shareholders, point out that management's job is to manage, and feel that the union's proposals are tantamount to a request for joint management.

While managerial responsibilities are probably the last thing it would actually wish to assume, the union would appear anxious to obtain access to a yardstick wherewith to measure increased productivity with the intention of claiming a share in the consequent savings.

One cannot but sympathize with employers who have to cope with this kind of muddled thinking. Union members already participate automatically in the benefits of lower costs as well as higher copper prices through the operation of the copper bonus. Moreover, in the R.S.T. group at least, employers who wish to increase their stake in the industry have an attractive share-purchase scheme. All this, surely, is enough profit-sharing for anyone.

In any case, the issue here and now is not profit-sharing but quite simply keeping the industry on a paying basis and safeguarding jobs. At the end of last month, the Chamber—confronted with stalemate—declared the existence of a dispute with the union over the introduction of economy measures. It may well be some weeks before the outcome of conciliation is known—weeks during which the companies can clearly make little progress towards higher efficiencies. If efforts at conciliation prove unavailing it would then be difficult to blame the companies if they were to try to push ahead with their plans.

If the union were then to co-operate, the ability of the mines to maintain present output at present prices would be much enhanced. Alternatively, in the regrettable event of the union calling a strike, we might at least see the price of copper higher.

MORE BORDER DISPUTES IN N. AFRICA

The first of what promises to be a series of disputes over mining rights in border areas in North Africa has arisen over the concession given by the French authorities to the Société des Mines du Jebel Guettara. The concession has been awarded for the exploitation of a manganese deposit in the Jebel Guettara, a range of hills 60 miles east of Beni Abbes (theoretically in French Algeria) and 155 miles west of Zagora in Morocco.

The Algerian-Moroccan border is undefined in this area. In fact, from Figuig in Eastern Morocco down to the Oued Dra, the frontier is not indicated at all on most maps or is shown by an uncertain dotted line.

The Department of Mines in the Ministry of Public Works here says that, as far as Morocco is concerned, the French company is "illegal" and the concession it claims is "null and void", the premise being that the Jebel Guettara is in Morocco and the concession was not awarded by the Moroccan Government, nor was the company registered in Morocco.

French officials "see no reason why Moroccan authorization should be necessary", and they declare that the Jebel Guettara is situated in the Saoura Province of the Organisation Commune des Régions Sahariennes (OCRS) formed by the French Government for the common exploitation of oil and mineral deposits in the Sahara.

Recently, the Moroccan Government indicated that it claims not merely peripheral areas in what are described as the "Confins Algériens", but also large tracts of desert east and south of Morocco's present borders, including the Tindouf area (where large iron ore deposits are situated), Mauretania in French West Africa (where the Fort Gouraud iron ore deposits are ready for exploitation), and the Spanish colonies of Rio de Oro and the Sahara.

The French-Moroccan border commission will have to arrive at an agreement on frontiers in these areas as well as in the corridor running from north to south from Nemours to Beni Abbes where the Jebel Guettara is situated.

AUSTRALIA'S METAL MINING INDUSTRY

The year 1957 was one of heavy production of base metals and other minerals in Australia, though accompanied by a steady decline in the prices for all metallic and mineral products. According to our correspondent in that country, company policies in the present year appear to be diverse.

The Broken Hill Mines have decided to reduce production by 10 per cent through a reduction in working time of one day per fortnight. The reduction has not yet come into force, but it has been reported that there will be a conference with employees. Employees' earnings will be still further affected, for the lead bonus has fallen from £A15 5s. per week in January, 1957, to £A9 5s. in February of this year.

Mount Isa Mines intends to continue as normally, and the £A20,000,000 expansion programme is to be pushed ahead without check. Reduction in output has not been proposed at Lake George Mines, but the economic position has been put clearly before employees, namely that ore-bodies are contracting with depth, that the fall in metals has cut into profits by some £600,000, and asking for the fullest employee co-operation, it being stressed that closure of the mine could seriously prejudice the prospect of re-opening when metals revive.

Plans of Electrolytic Zinc, in Tasmania, appear to be unchanged, but the zinc market will heavily curtail earning capacity of the company. Improvements and expansions at Mount Lyell Mining and Railway Co. may favour the cost position by increased output to some extent, but in the last financial year copper production was unprofitable. There will be help, however, from the entry into a higher grade ore zone. Tonnage and grade of ore at Mount Morgan had also improved at the end of the year, but profit for the year on mining was only £29,000. Notwithstanding the difficult economic position, employees are asking a rise in wages. The Tariff Board decision on assistance to the copper mining industry, yet to be announced, will have a very important bearing on the immediate future of these two companies.

Another enquiry of much importance to these companies is that into the Sulphuric Acid Bounty Act, the purpose of which is to encourage the use of local pyritic concentrates in place of imported brimstone. Increased pyrite sales would be of great importance, particularly to Mount Morgan, in the treatment of lower grade ore. About 50 per cent of Australia's sulphur requirements are met by brimstone, while available pyrite could supply the full needs.

Peko Mines is still maintaining normal ore production, on which profit is greatly reduced, and the latest mine in the copper group, Ravensthorpe Copper Mines, is in the difficult position of having just commenced production. The immediate future of the large tungsten producers, now forced to sell on the open market by expiry of contracts, must be regarded as uncertain, though both King Island Scheelite and Aberfoyle Tin have strong reserves and investments.

The beach sand operators are heavily hit; many have been forced to close down by the slump in the rutile market, zircon is at a very low level, and those companies continuing production have contracts at good prices behind them. Ilmenite producers in Western Australia appear to be satisfied with the market at the present time.

Although the price for gold and general conditions offer little encouragement to the industry, production was well maintained during 1957, Western Australian production reaching 896,683 f.oz., while dividends paid by the operating companies in the State were £A2,401,886, compared with £A2,199,083 in the previous year. Production showed an increase of 84,000 oz. over the previous year, but it should be noted that this arose from December returns, two clean-ups being made by a number of mines in that month. Premium sales by the Gold Producers' Association have helped, and material assistance has been given by the bounty received from the Commonwealth Government.

There seems to have been some increase in activity by prospecting, and small working parties, with satisfactory results. Two new gold mining companies were formed during the year, the Eclipse, at Mount Magnet, near the rich Hill 50 Mine, and the Bamboo Creek, in the north-west. Production by these mines should be felt late in the year.

THE FALL IN COAL PRODUCTION

With final results of the year's operations now available, it is now known that the 1957 total production of bituminous coal and anthracite in the U.S. fell short of the figure for the preceding year. In the soft coal industry production fell from the 1956 total of 501,000,000 s.tons to 488,000,000 s.tons, representing a drop of about 2.6 per cent. Anthracite output was down by 3,000,000 tons to 25,200,000 tons. The drop is attributed generally to a slight lowering in industrial activity and further captures by the oil and gas producers. The competition of non-solid fuels in the electric utilities—a key market for coal—is yearly becoming more intense. In 1957 total gas consumed in power stations, etc., was up by 10 per cent on the previous year and oil consumption up by nearly 11½ per cent. During this period the coal market only benefited by an ominously meagre 3 per cent gain.

Taken overall, however, the U.S. coal industry had a reasonably good year and can expect to maintain a high level of production in 1958.

Yet the same expectation cannot be extended to Germany and Spain.

In Germany, a fall-off in internal demand, together with increased imports, is responsible for rising pithead stocks of coal and recently six Ruhr collieries were temporarily closed. The margin between exports and imports has been lessening for some time and the surplus of exports over imports in 1957 was only 1,500,000 tons as against 18,000,000 tons in 1954. The situation has been aggravated by heavy falls in freight rates—now so low as to make U.S. imported coal cheaper than indigenous.

In Spain, the suspension of constitutional guarantees against arbitrary arrest has been decreed by the Cabinet in all coal-mining areas. This suggests that the recent strikes and lock-outs in the Oviedo field are considered by the Spanish Government to be potentially dangerous from a national standpoint. Although Spain only produces some 15,000,000 tons of coal per year, a major labour upheaval in the collieries would have serious repercussions. Suspension of guarantees against arbitrary arrest implies that action will be taken against miners not resuming work.

Detonating Relays for Short-delay Blasting

SHORT-DELAY blasting is now a firmly established technique in quarrying, opencast excavation and similar blasting operations. By its use, fragmentation is improved and excessive ground vibrations can be reduced. The improved fragmentation alone is often a sufficient advantage to justify the use of short-delay blasting methods, but the reduction in ground vibration is often of major importance if blasting is to take place near property or plant. Detonating relays used in conjunction with Cordtex are particularly advantageous because the delay periods that can be introduced into any blast are unlimited in number, they are simple to use, and no electrical circuit is required except for the single electric detonator to initiate the Cordtex.

The Detonating Relay

A detonating relay is a device which gives a delay of approximately 15 milliseconds when inserted into a line of Cordtex detonating fuse. This time interval has been found to give the best results in most types of quarry-blasting. Each relay is an assembly of two special delay detonators, crimped into aluminium connector sleeves and separated by a short length of neoprene tubing.

The Cordtex line is cut at any point between the two shotholes (or groups of shotholes) where the delay is required. A detonating relay is then firmly crimped between the two cut parts of the Cordtex, thus rejoining them. The operation is simple and speedy. The relay should be crimped in position immediately the Cordtex is cut, so that no explosive is spilt from the Cordtex. The crimps should be approximately $\frac{1}{4}$ in. from each end of the relay. The Cordtex line should then be laid out as straight as possible, avoiding any undue strain on the relay.

The relays are completely reversible, and it does not matter which way round they are placed when inserted into the Cordtex line.

Detonating relays used in conjunction with Cordtex have the following important advantages over other methods of achieving short-delay intervals in blasting:

- (a) The Cordtex line can be cut at any point and a relay inserted without difficulty. The only equipment required, other than the relays, is a pair of hand-crimpers;
- (b) Only one detonator is required to fire a blast. Under

Detonating relays, developed by the Nobel Division of Imperial Chemical Industries Ltd., provide a convenient means of achieving short-delay firing in blasts primed with Cordtex detonating fuse. Simple to use, the relays have proved reliable in quarries and opencast excavations. The illustration below is the diagram of a detonating relay.

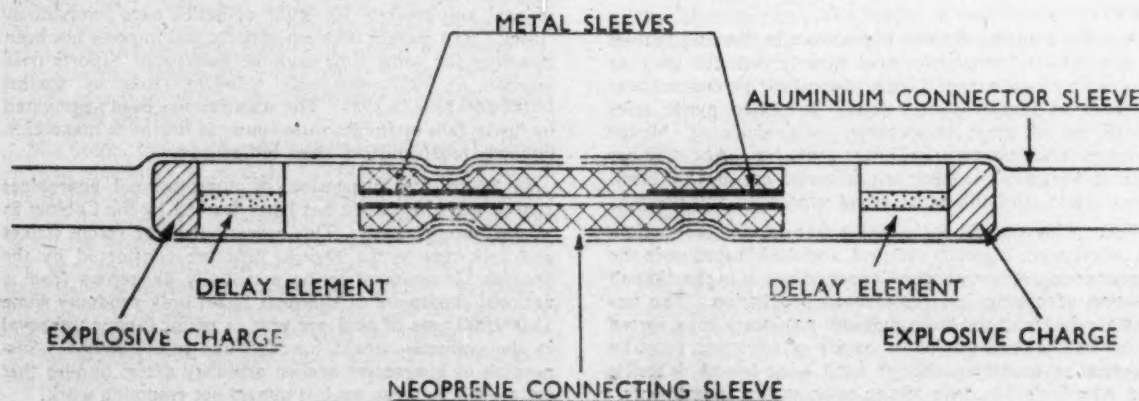
adverse conditions, where damp might cause current leakage or where there is a possibility of stray currents or static electricity, electric firing can be dispersed with entirely by using a plain detonator and safety fuse to fire the blast;

- (c) The number of delays in a blast fired by sequence switches, or by short-delay detonators, is limited by the number of electric circuits available or by the maximum number in the series of short-delay detonators. Using detonating relays, any number of delays can be introduced without any complication in the layout of the blast;
- (d) As there is no limit to the number of detonating relays that can be used, more shots can be fired without causing excessive ground vibrations;
- (e) Each detonating relay has a delay interval of approximately 15 milliseconds. Because the relays are inserted in series in any Cordtex line there is a greater regularity in the time of shots firing, and overlap is quite impossible. This gives excellent control of vibrations and fragmentation.

Detonating relays can be used with advantage in quarry blasts using well-holes and small-diameter holes.

Well-Hole Blasting

In well-hole blasting each hole is charged with explosive in the normal way. A line of Cordtex is threaded through the bottom cartridge, led up the borehole to the surface, and then cut off from the reel, leaving a "tail" of about 2 ft. emerging from the mouth of the hole. If deck-loading is used, a separate Cordtex line is led from each deck to the mouth of the hole in the usual manner. After all the holes have been charged, a main line of Cordtex is laid out



leading in turn to all the boreholes, and the tails of Cordtex are attached to this line by a clove hitch. The Cordtex is then cut at each point where a delay is required (this will usually be between each hole and the next) and a detonating relay inserted and crimped into position to rejoin the Cordtex line.

This arrangement gives a delay of approximately 15 milliseconds between each hole and is usually effective in giving good fragmentation with minimum ground vibrations.

Small-Diameter Vertical Holes

The principle of blasting with small-diameter vertical holes is the same as for well-holes, and the same methods can be used where the spacing is not less than 6 ft. Where the spacing is less than 6 ft., however, a delay of 15 milliseconds may result in cut-offs. In order to keep vibrations to a minimum, a suitable method is to drill the holes in groups, leaving a space of 6 ft. and inserting a detonating relay between each group. Each group will usually consist of four shots. This arrangement will normally be found to reduce the ground vibrations and still give good blasting results.

Blasts using horizontal holes can be fired using detonating relays, in the same manner as vertical holes. The charges can be fired with a detonating relay between each shot, or between groups of shots, according to the spacing

between the holes. As with vertical holes, to avoid cut-offs it is recommended that no detonating relay should be inserted unless the spacing is 6 ft. or more.

Short-delay firing is applicable, also, to blasts using vertical holes in combination with toe holes. According to the prevailing conditions, it is sometimes desirable to introduce a short delay between the toe holes and the corresponding vertical holes. This can easily be arranged by introducing a detonating relay in the appropriate Cordtex line between the detonator and the first hole or group of holes. The two main lines are then initiated by instantaneous electric detonators connected in series.

Use of Detonating Relays

Short-delay blasting using detonating relays can be employed with advantage in opencast mining, for reducing ground vibration, improving fragmentation and reducing overbreak. Where it is important to avoid excessive ground vibration, it is usual to initiate the charges in each hole by a separate delay; but where ground vibration is not a major problem, initiation of rows of holes simultaneously, but with a delay between the individual rows along the overburden, is frequently practised.

If the delays are so arranged as to "peel off" from the next succeeding highwall, the result is less overbreak on the highwall side, leaving a more solid highwall and safer working conditions in the cut.

The A.I.M.E. Annual Meeting, 1958

At the recent A.I.M.E. annual meeting in New York, the Minerals Beneficiation Division discussed some thirty-one papers. Further details may be obtained from the relevant issue of *Mining Engineering*, wherein a synopsis of the papers appeared.

Contributions on crushing and grinding included the result of single- and two-stage operation at Homestake, pebble mining using run-of-mine ores as grinding media and studies of wear. A contribution from Prof. Hakki, Finland, dealt with ball mill performance at super-critical speeds.

Methods of Concentration

With reference to methods of concentration, the relationship between magnetic susceptibility and composition was discussed with reference to the wolframite group and sphalerite. A markedly careful technique was devised. In a description of the technique, it was shown that in the case of wolframite, the susceptibility was lowest in the high iron members because the ferrous ion is lower than the manganese ion, although differences are not so appreciable as to affect separation. It is reported that susceptibility varies inversely as the sq. root of the iron content.

A paper reviewing new developments in Scandinavian and German magnetic separation practice was presented.

Remarks on Flotation

Other general papers covered the introduction of the leach flotation plant at Inspiration, first described in *The Mining World* (San Francisco) Vol. 19, No. 10. This plant is a new departure, necessitated by the increase in sulphide ore which rendered the former acid-ferric sulphate leach inefficient, and the trend in uranium milling. Three papers

dealt with mill design, including electrical supply and driving arrangements.

Considering flotation, the subjects covered at the meeting included the mechanism of flocculent adsorption of clay minerals, solubility of some metal ethylxanthates, activation and de-activation studies with copper on sphalerite, adsorption density, zeta potentials and flotation rates, collector mixtures and collector emulsions in sulphide mineral flotation.

Control Devices

At the present time, there is increasing interest in automatic and other control devices, and thus it is not surprising to find a session of the meeting devoted to this subject.

For example, a continuous analyzer has been developed which weighs and analyzes 1,440 samples in 24 hours. The results are recorded in under 10 minutes after a sample enters the apparatus. The method is essentially a colorimetric one. On the hydrometallurgical side, the developments in the use of resin in pulp processing and the employment of solvent extraction in uranium plants were discussed. Apparently the Eldorado Mining Co.'s plant at Port Radium will adopt the latter process, replacing the existing aluminium reduction this year when the triisocetyl amine will be used as the solvent diluted with fuel oil. Sodium carbonate stripping and sodium hydroxide precipitation will be used. A similar amine is being tested at Climax Uranium Co. for vanadium extraction.

A new possibility is that UF₆ may be made directly from a second solvent extraction stage when the fluoride is precipitated from a specific alkyl phosphate. Thickening filtration and flocculation was covered in a special short symposium.

Opal Mining in Australia

OF all semi-precious stones opal requires the most careful handling. Its hardness being only 5½ to 6 (Moh) it can easily be scratched and the appearance of opals is irretrievably damaged by heat. Opals also absorb water, one variety hydrophane not becoming opalescent until soaked in water. The accidental absorption of coloured liquids can despoil the appearance of opal jewellery and the contrary process of dehydration can lead to shrinkage and the loss of stones from their settings.

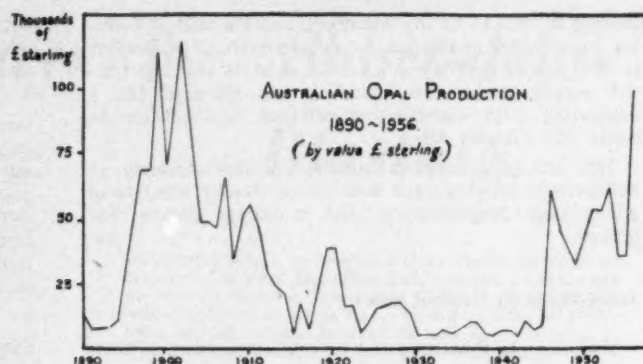
Opal is, in fact, hydrated silica, the water content generally being less than 10 per cent. It has been produced in Mexico, Honduras, Cserwenitsa in Hungary, and the Kaschau district of Czechoslovakia, but the only producer of any size today is Australia.

Australia's opals are found in New South Wales, Queensland and South Australia. White Cliff, New South Wales and Queensland accounted for all the Australian output at the beginning of the century when opal production was at its height. In 1905 the first production was made from the Lightning Ridge field in New South Wales which produced "black" opals commanding a high price. The discovery of this field did little, however, to affect the overall decline in Australian opal production which at its lowest in 1932 was valued at only a thirtieth of the production 30 years earlier. The value of Australian opal production remained at a low level until immediately after the Second World War when something of a revival took place in the industry.

The Producing Areas

Today there is a small production from the Lightning Ridge field, N.S.W., where black opal is still obtained and a similarly small output from the Hayricks Mine in the Quilpie District of Queensland. The principal producing fields are now those of South Australia, this State having to date produced about one-third of recorded Australian production (New South Wales, although only a very small producer in recent years, still accounts for about 60 per cent of total recorded production mainly by virtue of the large quantities produced about the beginning of the century). The Coober Pedy field in South Australia is the area with the largest output at the present time, the other South Australian field at Andamooka having a smaller output of rather better average quality.

The Coober Pedy field, which is about 600 miles north of Adelaide, covers an area of over 2,000 sq. miles in which there are numerous small producers operating in places bearing such picturesque names as Nine Mile Hill, Deadman's Flat and German Gully, but where the commonest names are of the type "Four Mile" and "Eleven Mile" field indicating the type of country where distance is the



main distinguishing characteristic in an otherwise featureless terrain. Mineral claims in this field are 150 ft. sq. and the workings on them are for the most part of very primitive nature extending to only shallow depths. The deepest mining currently taking place is at less than 100 ft. below the surface.

It was the discovery of the rich "Eight Mile" field at Coober Pedy which was responsible for the rapid rise in opal production in 1946. With the exhaustion of "Eight Mile" the "Twelve Mile" field has become the largest producer.

Production Statistics

The actual production of opal is difficult to assess. The production statistics published by the Australian Department of Mines (on which the accompanying graph is based), are given in terms of the monetary value of production. The price received for opal as mined varies between a few shillings per oz. to about £150 per oz., whilst particularly fine opal may be sold by the carat. Moreover, the platy nature of opal often demands that a certain amount of the matrix be left adhering to the opal if it is not to fracture and its gem qualities lost.

Opal production from the mines is sorted into lots for valuation depending on the colour, size and shape of the stones. The whole nature of opal occurrences is so sporadic that this sorting will always give widely different results and quite large increases in the value of production can be accounted for by higher average prices received rather than actual increased production.

In 1956, however, the value of Australian opal output fell just short of £100,000, a steep increase on previous years reflecting higher actual production.

Export figures for Australian opal have been increasing faster than the value of production. Demand for stones has been keen and higher prices probably account for some of the rise but the largest factor involved is the removal of excess matrix and rough cutting of the stones prior to export. Statistical data regarding the proportion of cut stones exported is not available. The principal importing countries of opal are the U.S.A., Federal Germany and Ceylon, whilst Hong Kong has recently been an important buyer. New Zealand and Japan are among other countries importing opal from Australia.

In the U.K. imports of opal from Australia are valued at £3,000 or £4,000 annually. In addition, fire opal, a red variety of opal, and water opal, a milky white variety, are obtained from Mexico. Neither of these varieties display the true quality of opalescence (produced by the phase interference of light), that is found in Australian opals and notably in the black opals of the Lightning Ridge field.

COLUMBIUM AND TANTALUM—I

The Development of Columbium and Tantalum

COLUMBIUM (niobium) and tantalum have been known for more than a century and a half, but only during the last 25 years have they commenced to take their proper place in the metallurgical field.

The introduction of columbium to steels of the 18 p.c. chromium - 8 p.c. nickel type, prevented intergranular corrosion when the steel was exposed to high temperatures and chemical corrosion, and also prevented failure in weld and adjacent zones. This development resulted in the production of ferrocolumbium by the Electro-Metallurgical Co. and the first major-end use for columbium.

Until this development, world production of tantalite ore was obtained mainly from alluvial material in the Pilbarra field of Australia, and producers were not paid for the columbium content of the tantalite ores. From about 1935, European steelmakers began to replace tantalum in stainless steels by columbium, because it was found to be more effective, in greater supply, and less expensive.

The great affinity of tantalum for all common gases led to its extensive use in the radio valve industry, and with the advent of radar during World War II, the demand for tantalum for use as a "getter" increased.

The collapse of European markets as a result of German occupation in 1940 meant that the Belgian Congo, Nigeria, Brazil and other African production were all diverted to the U.S., with some material going to the U.K.

Murex Ltd., at Rainham, Essex, started production of ferro-columbium-tantalum and its sintered carbides.

The Metals Reserve Co. of the U.S. Government started purchasing tantalite and columbite in 1942 and in May, 1943, respectively. At the end of 1945 it stopped buying both metals, disposed of its stock of columbite on the market, and transferred the tantalite to the Strategic Stockpile. The War Production Board control over importation and consumption was discontinued at the end of 1944.

The demand for tantalite dropped at the end of the war, but the demand for columbite continued at a high level owing to the development of the gas turbine engine, coupled with the fact that the tin gravel tailings reserve had been depleted during World War II.

In May, 1952, the Defence Materials Procurement Agency of the U.S. Government doubled the existing world price for columbite-tantalite ores until they had received 15,000,000 lb. of Cb_2O_5 plus Ta_2O_5 . The price was an average of about \$3.40 per lb. of contained combined pentoxides in a 50 per cent concentrate. This programme stimulated prospecting and recovery of columbium ores and caused consumers to seek substitutes as the price of ferrocolumbium rose to \$12.00 a lb. of contained columbium. Another outcome was a three-fold increase in world mine production, most of it as a by-product.

The advent of turbo-jet engines, guided missiles, rockets and nuclear energy, is hastening the development of columbium (niobium) and tantalum. This review is extracted from a comprehensive survey of these metals prepared by R. J. Jones, of the Mineral Resources Division, Mines Branch, Department of Mines and Technical Surveys, Canada (Memorandum Series No. 135, price 50 c.). The Mines Branch is participating in a joint research programme by industry and government to solve the extractive and process metallurgy problems hampering the development of Canada's large resources of pyrochlore.

The U.S. Government purchasing programme was terminated in May, 1955, when it was announced that deliveries to the stockpile plus forward commitments equalled the objective. The immediate effect of this announcement was confusion on the part of both producers and consumers, which resulted in an unstable market.

The author of the survey considers that, although production may drop in certain localities owing to the lower prices now prevailing, the level should remain well ahead of that existing before 1952. It remains for research and development to lead columbium into its proper niche in the metallurgical field.

Columbium and Tantalum Minerals

The present important commercial minerals of columbium and tantalum are columbite and tantalite which are, respectively, a columbate and tantalate of iron and manganese. They occur in granite pegmatites and in residual or alluvial deposits derived from such rock. Being closely related minerals and difficult to distinguish from one another, they require precise chemical analysis for their differentiation, although specific gravity methods can be successfully used.

Pyrochlore, a mineral which occurs in alkali rocks, is the source of columbium production from Sove, near Ulefoss in Norway, and from Freiberg, Germany. It is a complex columbate of cerium, calcium, sodium with some titanium, thorium, fluorine and a little tantalum. In Canada, there is generally some radioactivity associated with pyrochlore deposits, and this fact has been responsible for large discoveries in recent years such as those in British Columbia, Ontario and Quebec. Extraction of columbium from these deposits still presents metallurgical difficulties.

Minerals of the pyrochlore group also include koppite, hatchettolite, microilite, betafite and perovskite.

Fergusonite is a tantalate and columbate of yttrium, erbium and cerium. Samarskite is a complex tantalate and columbate of iron, yttrium, calcium and cerium. The mineral group known as euxenite comprises tantalates and columbates of yttrium, cerium and uranium.

Production of columbium and tantalum ores has, up to the present, been derived from tin-bearing gravels and eluvial and alluvial pegmatites, mainly from Africa, Brazil and Australia.

Nigeria is by far the world's most important source of columbite. Its production of tantalite is negligible. The mineral is widely distributed in the alluvial tin deposits in northern Nigeria and is obtained mainly as a co-product of tin mining. Columbite occurs as a widely disseminated primary accessory material in the weathered biotite granites. At Kuru, in an area mined by Jantar Nigeria Co. Ltd., the columbite-tin ratio is about 1 : 25. In the Liruei Hills, Kaou province, it is as high as 1 : 3.

The bonus price offered by the U.S. Government in 1952 resulted in a very substantial increase in production from newly-mined gravels and from old tailings and dumps and in intensive exploration for new deposits. During the

calendar year 1955 output reached a peak of 3,146 t.ons. At the end of the year estimated reserves of columbite were 62,500 tons. In the Kaffo Valley granites, however, there are inferred reserves of pyrochlore-bearing granites of the order of several hundred million tons.

The Belgian Congo ranks next to Nigeria in the production of columbium and tantalum minerals. Production is derived as a co-product with tin in the sluicing of gravels and also from the Manono tin smelter slags, which are shipped to the U.S. for recovery of the tantalum and columbium.

The largest producer is Géomines, which commenced production in 1939. Other important producers are Symétain, Minétain, Somuki, Sermikat and Minière Grands Lacs, which operate mines in the Congo and Ruanda-Urundi. Material from the Congo is an intermediate grade of tantalite averaging about 35 per cent Ta_2O_5 and 30 per cent Cb_2O_5 . Since 1947, a tin-columbium-tantalum concentrate has also been produced containing about 10 per cent Ta_2O_5 plus Cb_2O_5 .

World Production

The world's supply of high-grade tantalite (60 per cent Ta_2O_5) is derived mainly from the States of Rio Grande de Norte and Paraíba in north-east Brazil and from the State of Minas Geraes in the south. Tantalite and beryl are obtained as co-products from pegmatite dykes which have been mined since 1937. The properties are generally worked by primitive methods. Other promising localities are Ramalhte near Pecanha, Rio Dore Valley and Santana de Suassui, State of Minas Geraes.

Before World War II Australia was the leading producer of high-grade tantalite with a Ta_2O_5 content of 65 per cent and less than 10 per cent Cb_2O_5 . Production is mainly obtained from the Wodgina pegmatite dyke about 70 miles south of Port Hedland in Western Australia. It has been more or less continuous since 1905.

In Norway, Norsk Bergverk in co-operation with Norsk Hydro are operating a pyrochlore deposit (koppite) about 65 miles south-west of Oslo near Ulefoss in Telemark county. The columbium mineral is contained in a limestone with an apatite content of from 6 to 10 per cent. The average columbium pentoxide content of the ore is 0.2 to 0.3 per cent. Ore reserves of the area are in the region of 11,000,000 tons. Production was commenced in 1953 with the assistance of a U.S. loan and is at present about 30 tons of concentrate per month.

A deposit of metamorphic limestone containing koppite is being mined at Kaiserstull near Freiberg in south-west Germany. Part of the output is refined in France, the balance being exported to the U.S.

In Portugal production in recent years has been obtained from the re-treatment of alluvial tin tailing dumps from Caminha. Columbite also occurs in wolframite deposits at Viano de Castelo.

Production of tantalite-columbite in Uganda started in 1936, mainly from pegmatite dykes west of Lake Victoria and east of Lake Edward associated with tin and gold. Large quantities of pyrochlore have been discovered in a red soil calcerous complex of the Sukulu plug near Tororo. Average grade is 13.1 per cent P_2O_5 and 0.20 per cent Cb_2O_5 . Associated minerals are apatite, baddeleyite, zircon, tremolite, ilmenite and magnetite. Other promising areas are at Nampeyo Hill north of Kampalo, Okollo in West Nile, and Buswale in south-east Uganda. The U.S. firm of Colin Mathieson Chemical Corporation, together with Frobisher Ltd. and Uganda Development Corporation, are exploiting these deposits under the name of Tororo

Exploration Co. with a view to production in 1958. Production of apatite concentrates in a pilot plant started in October, 1956.

At Panda Hill, near Mbeya in Tanganyika, a deposit of carbonatite containing pyrochlore was discovered by the Tanganyika Geological Survey and is estimated to comprise many million of tons. It is being developed by the Mbeya Exploration Co. Ltd. owned jointly by N. V. Biliton Maatschappij and the Colonial Development Corporation. A pilot plant was recently opened.

In Northern Rhodesia Anglo American Corporation are examining the possibilities of extracting pyrochlore from limestone at Nkombwa Hill in the Isoka district. The Corporation has also discovered a similar deposit in the Feira district in the Central Province about 150 miles from Lusaka.

Mozambique's production of tantalite is derived from eluvial and alluvial pegmatite deposits and from the uranium-bearing mineral, samarskite, which is mined in the Tete district. Production of samarskite was commenced about 1948 and has been increasing ever since.

An extensive deposit of columbium mineralization, known as the Mrina Hill deposit, occurs in Kenya 10 miles from the coast, near the Tanganyika border. The Anglo American Corporation is investigating this deposit, which is estimated at 26,000,000 tons running 0.78 per cent Cb_2O_5 , together with monazite and rare earths.

In Southern Rhodesia there is a small production of tantalite from the Bikita district, where it occurs in rich "spots" in pegmatite areas.

The Scene in the United States

The U.S., which is the largest consumer of columbite ores, is among the smaller producers and depends on imports for practically all its requirements. For a number of years there has been intermittent production of columbite from the pegmatite mines in the Black Hills, South Dakota and New Mexico, mainly as a by-product of mica, feldspar and beryl mining. A tantalite-lithium deposit near Tinton, South Dakota, is operated by Fansteel Metallurgical Corporation.

Large reserves of columbium are known to occur in bauxite deposits and in titanium mineral deposits of the Magnet Cove area, Arkansas. An ilmenite fraction of the bauxite black sand contains as high as 0.86 per cent columbium. The red-mud waste from bauxite mining and processing contains a large reserve of columbium. Placer deposits in Bear Valley and Cascade, Idaho, containing about 0.25 lb. of columbium per yd. have been examined by the U.S. Bureau of Mines. The deposit of Bear Valley came into production during 1956 as the result of a purchase contract with G.S.A.

Columbite occurs in the large alluvial tin deposits of Malaya, but the content is very small. The slag dumps of the tin smelters contain recoverable quantities of the material.

In British Guiana large deposits of columbite exist in the valleys of the Rumong-Rumong and Morabisi Rivers about 100 miles south-west of Georgetown. Kennametal International S.A. are developing a deposit in the Rumong-Rumong area where ilmenorutile occurs together with about 4½ lb. of columbite in a cu. yd. of material. Deposits in the Morabisi River area average about 2 lb. of columbite per yd.

The occurrence of columbite in Argentina and of tantalite-columbite minerals in South West Africa is also noted in the survey.

Machinery and Equipment

Diamond Mining Equipment in South West Africa

For every 1 lb. of diamonds recovered by Consolidated Diamond Mines of South West Africa Ltd., 65,000,000 lb. of sand, rock, gravel, and gypsum have to be handled.

To move this volume of material the company has chosen a fleet of 88 LeTourneau-Westinghouse self-powered electric-control scrapers, rear-dumps, and tractors. These machines are moving 885,000 cu. yds. (677,000 cu. m.) of overburden per month—more than 8,500,000 tons per year.

Most of their work is done along a narrow 200-mile-long strip of land located one to twenty miles inland from the Atlantic.

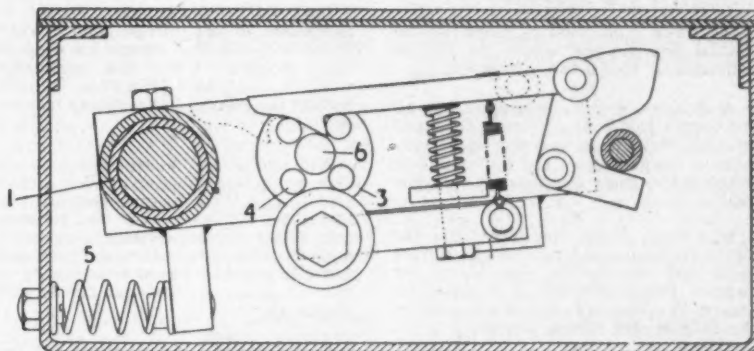
Consolidated Diamond Mines now uses a prospecting fleet of twenty-four Tournapull Scrapers and ten Tournapull tractors to clear large exploratory trenches through the sand and calcrete. When finished, the average trench measures 1,600 ft. (500 m.) long, 30 to 50 ft. (9 to 15 m.) deep, and 10 to 15 ft. (3 to 4½ m.) wide.

Should subsequent analysis prove of sufficient richness, a primary crushing and screening plant is then built. Shovels or draglines are brought in and some of the company's forty-two Tournapull Rear-Dumps are driven to the mining site. The amount of overburden stripped has increased by 91 per cent and the amount of diamond-bearing gravel treated has increased by 34 per cent.

A MINE CAR COUNTING SWITCH

A spring-return limit switch for use in mine-car circuits, to eliminate the need for counting relays, has been designed in the North-Eastern Division, N.C.B., and has been used with success in that division.

The switch is operated by an arm fitted with a roller which is depressed by the passage of a mine-car, and is suitable for mounting in the track for direct operation by the car wheels. Alternatively, each of several projections on a passing car may be arranged to cause the arm to depress. The purpose of this device is to ensure that only one of a given number of such depressions actuates the switch mechanism. It can thus be arranged that



the switch will allow a predetermined number of cars to pass before operating.

The number of depressions of the roller arm for each operation of the switch is decided by a combination of the number of lugs provided on a ratchet-operated disc in the mechanism and by the arrangement of the insulating arms which actually depress the switch.

Above: A section of the Wakefield counting switch box, containing mechanism, and showing arrangement of ratchet

Below: A section through the Wakefield switch box, showing the arm that depresses the switch

Above is a section of the box containing the mechanism, showing the arrangement of the ratchet. The shaft (1) is carried right through the box, and at its outer end is attached to the roller arm. Each depression of this arm causes the spring-loaded pawl to jump over one of the cylindrical lugs (4) in the disc (3). Although four of these lugs are shown in the drawing, their number can be varied to suit the predetermined number of depressions of the arm required to operate the switch. When the roller arm returns to its original position under the action of the spring (5), the disc (3) is rotated by the ratchet action through part of a revolution. This movement also rotates the shaft (6).

Below is another section through the box, showing the arm which actually depresses the switch. In this instance the arm consists of a laminated bakelized sheet carried on the shaft (6), noted in the other illustration. The switch is only operated when the sheet is in the position shown; movement of the sheet to the dotted position, under the ratchet action, neutralizes the action of the roller arm, and in this position depression of the arm does not actuate the switch.

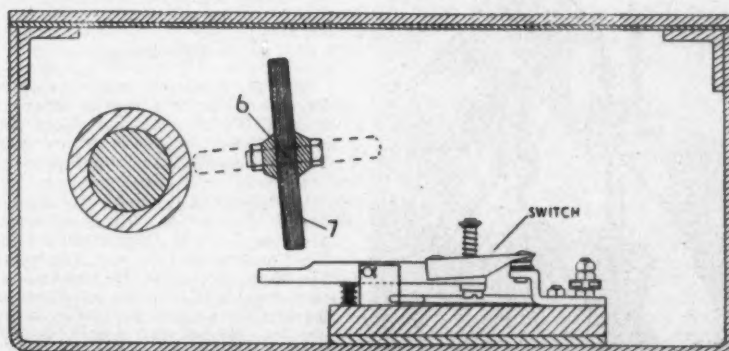
This is an arrangement under which the switch is operated for every half-revolution of the shaft (6). The design can be modified by removing one-half of the laminated sheet, and the switch then operates once in every complete revolution of the shaft (6).

In the arrangement illustrated the switch will operate at every other depression of the roller arm; if the modifications discussed above are introduced, i.e. six lugs on the disc (3) and removal of half the laminated sheet (6), six movements of the arm are needed before the switch is actuated. Other combinations can be introduced to suit specific requirements.

NEW RESCUE APPARATUS

A new safety publication by the U.S. Bureau of Mines describes recommended use and maintenance of recently approved mine-rescue equipment. The report, which centres on apparatus capable of being worn in hazardous atmospheres for periods of half an hour and three quarters of an hour, is based on intensive testing in Bureau laboratories.

For many years the two-hour self-contained oxygen-breathing apparatus has been the standard for mine-rescue teams, and the development of the lighter weight half-hour and three-quarter-hour equipment has not altered the importance of the older device. The newer equipment is thus described as "auxiliary and supplemental". The reports adds, however, that the auxiliary breathing apparatus can play an important part in mine safety, and urges that rescue teams drilled in using the traditional two-hour type likewise be skilled in using the newer devices.



MINING MISCELLANY

Canada has offered to supply \$10,000,000 worth of non-ferrous metals to India under the Colombo Plan.

Norway's production of aluminium at Aardal and Sunndal works for 1957 is estimated at 66,000 ton, a new record.

A Japanese firm has offered to buy all the copper-gold concentrates to be mined by the Philippines undertaking, Philex Mining Corporation. The Philex mill is scheduled to begin operating in May this year.

M. Paul Finet, president of the European Coal and Steel Pool, is to have talks with M. Achille van Acker, the Belgian Prime Minister in Brussels on March 25. They will discuss the crisis in the Belgian coal mining industry.

American and German experts and technicians have arrived in Israel to supervise the running-in of the copper works at Timna, near Elath. They represent the German companies which supplied the machinery and other installations and the American company which planned the sulphuric acid plant.

It is estimated that more than 2,700 oz. gold can be mined during 1958 in Liaoning and Heilungkiang Provinces, China. In the former Province three gold refineries are to be built. The Liaoning gold ore deposits are estimated at 3,400,000 tons.

The East Pakistan Government is to set up a Mining Development Corporation to prospect, mine and develop the country's mineral resources. There is as yet no firm indication of the existence of

mineral deposits of adequate quality or workable quantity.

India and Poland have signed an agreement in New Delhi, under which India will pay in rupees for imports from Poland. Under the agreement, which is valid until December 31, 1959, Poland has offered India mining machinery.

A party of five Soviet experts in the underground gasification of coal arrived last Thursday for a fortnight's visit to the U.K., as guests of the National Coal Board. A British team spent a fortnight inspecting installations in Russia last November. The Russian party is due to return to Moscow on Sunday, March 30.

Six German industrialists, among them Herr H. Birnbaum, Under-Secretary to the Treasury of the Federal German Republic, have arrived in South Africa to study local shaft-sinking methods. The party, which plans to stay in the Union for three weeks, is headed by Dr. Konrad Ende, general manager of the State-sponsored Salzgitter industrial and mining group of companies.

The Ore Knob mine, North Carolina, has known markedly varying fortunes since it was discovered in the days prior to the American Civil War. In the decade following 1873, Ore Knob produced nearly 25,000,000 lb. of copper from some 200,000 tons of ore, assaying up to 7 per cent Cu. There followed a period of short-term operations, of closure and boom, until 1942, when the U.S. Bureau of Mines began a development project at the property. But this, too, was aban-

doned. Yet life was not extinct, and in May, 1955, Appalachian Sulphides Inc., a wholly-owned subsidiary of the Nipissing Mines Co. Ltd., began sinking a 1,037-ft. shaft. Development began in August, 1956. Production started exactly a year ago—on March 15, 1957—and currently is at an average of 375 tons per day. It is anticipated that the mine will produce 800 tons of ore daily in 1958. The average assay value of the ore is now approximately 3 per cent with 96 per cent copper recovery. Concentrates run to 26-27 per cent Cu. Annual production should achieve 14,000,000 lb. of copper. Equipment now in use at Ore Knob includes eighteen Atlas Copco "Lion" (BBC22WK) rock-drills, fifteen Atlas Copco "Falcon" stopers (BBD46-WR), ten Atlas Copco plug drills, and a full stock of Sandvik Coromant integral drill steels.

The Commonwealth Scientific and Industrial Research Organization has been conducting rain-making experiments over the past two years, and has achieved a striking measure of success. The procedure is to "seed" cloud, by means of aircraft, with silver iodide, by which means precipitation is effected. It is necessary to have cloud in the first place and that the cloud be of the right kind. The experiments have been made mainly in New South Wales, and while the experimenters were reluctant to claim success for some time, recent work has confirmed the success of the work. Directors of Mary Kathleen Uranium Ltd., in the Cloncurry-Mount Isa district of North Queensland, have been so impressed that the method is to be given a large-scale test for the first time in Australian mining. The construction of the mill on this great uranium mining project is so far ahead of schedule that it has become very important to have adequate water available at an earlier date than had been anticipated. The company's 3,000,000 gal. dam on the Corella River is not yet full, for rain falls only in the wet season of three months in the year. An aircraft has been chartered, and for the next two months will be stationed on the mine property to take advantage of the presence of the right type of cloud and effect precipitation over the watershed feeding the Corella River. Production of uranium is expected to be commenced at the end of this year.

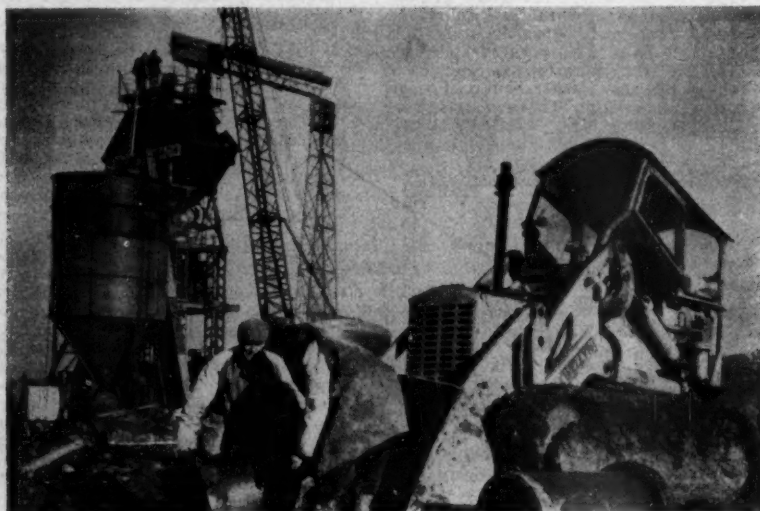
An important objective of the 1958 Geological Survey in China is the search for further sources of chromium, nickel, petroleum, mercury and gold.

PERSONAL

Mr. R. Counsell, sales manager of Revol Ltd., is on a tour of Africa and will visit Revol's 17 agencies and depots in the Union of South Africa, Kenya, Tanganyika, Rhodesia and Nyasaland.

We regret to announce the death, on March 13, of Mr. Richmond Temple. Mr. Temple was a director of the London Tin Corporation Ltd., and Amalgamated Tin Mines of Nigeria. He was among the men responsible for the introduction of the first Tin Control Scheme in the early 'thirties. He was also largely responsible for the organization of the Tin Industrial

The soil stripping and major earthmoving at Hinkley Point, Somerset, of what will be the largest nuclear power station in the world is nearing completion and work has started on the construction of the foundations of the first of two reactors. The contract was awarded to the English Electric-Babcock and Wilcox-Taylor Woodrow atomic power group on September 12, 1957, and earthmoving operations were started soon afterwards. The station is expected to be completed within five years' time



Applications Committee in 1929 out of which grew the International Tin Research and Development Council.

After 35 years' service as secretary of the London Chamber of Commerce, Mr. A. de V. Leigh will be retiring on September 30. Mr. W. J. Luxton, secretary of the Birmingham Chamber of Commerce, has been appointed to succeed him on that date.

Mr. S. A. Comley has been appointed by Uddeholm Ltd. as London area manager, tool steel division. His position in Birmingham will be taken by Mr. A. G. Shaw.

The Golden Jubilee Banquet of The Institute of Metals will be held, under the presidency of Marshal of the Royal Air Force The Lord Tedder, in the Great Room of Grosvenor House, Park Lane, London, W.1, on Thursday, May 1. The principal guest will be The Right Hon. The Lord Hailsham, Lord President of the Council, who will be accompanied by Lady Hailsham. Tickets may now be obtained from the Secretary of the Institute, 17 Belgrave Square, London, S.W.1.

COMPANY EVENTS

W. H. Stentiford & Co. have been appointed registrars of the London, Australian and General Exploration Co. Ltd. as from March 17, 1958, and the register of members will be maintained at 1 Broad St. Place, London, E.C.2.

An agreement has been signed between Enfield Cables Ltd. and Federal Wire and Cable Division, H. K. Porter Co. (Canada) Ltd., whereby the latter company will market Enfield products in Canada. The agreement also provides for the sharing of technicalities.

The Hanomag Co., a prominent West German tractor manufacturer, is reported

to be considering the establishment of a plant in the U.K. in order to profit from the preferential duties in the Commonwealth. The present export rate for caterpillar tractors from Hanomag is approximately 25 to 30 per cent.

All office departments of Lang-Lenden Ltd. will, as from March 24, be accommodated at 45 Hampstead Road, London, N.W.1. The telephone number and telegraphic address will remain unchanged: telephone Euston 3744 (two lines), telegrams Centrilang.

By an agreement between Ericsson Telephones Ltd. and the Solartron Electronic Group Ltd., Solartron will sell certain Ericsson products. The arrangement will have world-wide scope except in Scandinavia and South Africa, and includes the United Kingdom. The arrangement is concerned with the many unique nucleonic and electronic instruments and components manufactured by Ericsson.

The Sales Director of Igran Electric Co. Ltd., Mr. R. L. Paice, relinquished this position on March 1, 1958. The Sales Manager, Mr. A. W. Page, will, from that date, be responsible for the Home and Export Sales Organization, while Mr. Paice, as a director, will carry out special assignments of the board.

Henry Rogers (London) Ltd. have changed their address to 2 Copthall Buildings, Copthall Avenue, London, E.C.2 (telephone number National 0661).

Le Grand, Sutcliffe and Gell Ltd. will open a Middle Eastern office early in March at Attar Street, Karrada Sharquiah, Baghdad. The new office will be under the direction of Mr. G. Vann, who is a director of both Le Grand-ADSCO Ltd. and Site Investigation Co. Ltd. The office is being established to represent

Le Grand-ADSCO Ltd. and control its drilling operations throughout the Arab world. Its current activities include drilling to prove reserves of raw materials for cement in Qatar, with geological work by SICO Ltd. From the new office Site Investigation Co. Ltd. will control its geological and geophysical operations, which include mineral surveys in Iraq, Lebanon, Syria, Iran and Qatar. Mr. Vann will also act as technical sales representative of Le Grand Rochester Ltd., manufacturers of oilfield pumping and well-head equipment and water-pumping equipment.

BTR Industries Ltd. have concluded a licensing agreement with Tube Turns Plastics Inc., of Louisville, Kentucky, U.S.A., for the manufacture in Great Britain of unplasticized polyvinyl chloride pipe fittings, valves and custom-moulded parts by the Hendry process. Tube Turns Plastics Inc. is the largest American manufacturer of injection-moulded PVC pipe fittings and valves. The Hendry process, which is covered by British patents, is being employed in this country for the first time by a British manufacturer.

The Chamberlain Group of Companies now includes a new company, Chamberlain Plant, Ltd., to deal with plant sale and hire of Chamberlain Industries. The new company's offices and works are situated at: Crown Works, Southbury Road, Enfield, Middlesex.

H. Leverton and Co. Ltd. have extended their facilities. Their new office is situated on the main A62 Leeds-Huddersfield Road. The address is: Leverton of Leeds, Ltd., Gelderd Road, Gildersome, Leeds. Tel.: Morley 4221, Telex No. 55-170.

CONTRACTS AND TENDERS

The following future authorizations have been announced by the International Co-operation Administration:

Greece

White metal, 5.0 kgs., chemical composition specified. Issuing authority: State Procurement Service, 56 Panepistimiou Street., Athens. Closing date: 1/4/58. Ref.: ESB/7096/58. Telephone enquiries to Chancery 4411, extension 738 or 771.

Taiwan (Formosa)

Various chemical plant equipments, roasters, jaw and cone crushers, vibrating screens. Issuing authority: Director, Division for Central Trust of China, Chinese Government Procurement and Services Mission, Room 1008, 149 Broadway, New York 6. Closing date: March 26, 27, 28, 1958. Ref.: ESB/6656/58. Telephone enquiries to Chancery 4411, extension 354.

Mr. S. Ross, 3150 S.E. 45 Avenue, Portland, Oregon, wishes to receive quotations from U.K. suppliers of rope; pure manilla, wire and stainless steel. Various diameters. Quotations should show both f.o.b. and c.i.f. Portland prices in \$U.S. Ref.: ESB/6833/58. Telephone enquiries to Chancery 4411, extension 776 or 866.

Salzgitter G.m.b.H. has been awarded a contract for the construction of a third blast furnace with an annual capacity of 325,000 tons at Karabuk. This contract had previously been awarded to Krupps, but had been cancelled.

Canada's Shopping List—III.

In view of the encouraging results which continue to be obtained from its diamond-drilling programme, Hull Iron Mines has decided to go underground at its iron prospect some five miles from Hull, Quebec. It is anticipated that by April the programme will be under way, using hydroelectric power, but an earlier start may be made with temporary power.

The company is reported to have drawn up plans for an inclined entry to be driven parallel to the known deposit, which will serve as a conveyor way if production is attained. The *Northern Miner* states that a considerable saving in later hoisting and handling costs may be effected through the use of an incline and conveyor, as compared with the costs of through hoisting in a conventional shaft. Tenders are currently being received for driving the incline.

American Chibougamau Mines has a 25 per cent continuing interest in this property, which includes the former Forsyth mine — a source of iron shipments many years ago.

Mr. G. McCartney, president of Montgomery Explorations, states that by cutting the price of its lithium concentrates to \$7-\$8 a unit, this company hopes to obtain sufficient advance contracts to

proceed with mill construction this spring. Negotiations are currently in progress with various U.S. interests who are prepared to purchase large quantities of lithium concentrates. Substantial quantities of pollulite ores containing caesium are also reported to be available. A three-compartment production shaft has been sunk to a depth of 307 ft. Excavation on the mill site was suspended last year after American Metal Co. relinquished its option to bring the property to production.

In view of the large potential indicated by diamond drilling and the encouraging progress of metallurgical research, the Gourd-Riverin group of columbium companies in the Oka district, Quebec, are reported to be negotiating for the major financing that mining and production plans are expected to require. The group includes St. Lawrence River Mines, Oka Uranium and Metals Ltd., Main Oka Mining Corp., and Montrose Securities Ltd., whose properties are all situated close together in the main section of the area. All these companies have adequate funds on hand for current requirements, as well as unissued Treasury shares available for financing. The indicated tonnage in several deposits on their properties aggregates 82,000,000 tons grading 0.3-0.4 per cent Cb_2O_5 .

Metals and Minerals

Inco Cuts Production

Nickel has long been in short supply and until a few months ago it was expected that the gap between production and demand, though narrowing, would remain for a considerable time to come. As recently as October last year, Dr. J. F. Thompson, chairman of Inco, stated that, in the absence of a major world recession, the industry's chief problem was to make enough nickel available for future needs. There is no reason to suppose that, on the long view, this opinion requires any modification. So far as the immediate future is concerned, however, the situation has changed so drastically that Inco now finds it expedient to curtail production of nickel in Canada by approximately 10 per cent or about 1,250 s.tons a month. This involves a corresponding reduction in the output of the subsidiary metals refined from the nickel ores, including copper and platinum.

Throughout 1957 the company operated at capacity for the eighth consecutive year, its deliveries of 145,000 s.tons of nickel approximating to the all-time peak established in 1955. By the beginning of 1958, however, the rate of nickel production by Inco and other nickel producers had become substantially in excess of total market demand as well as consumption. Stocks of nickel in the hands of the company and of the U.S. Government, as a result of industry's inability to take nickel offered to the trade instead of being stockpiled, were accumulating at a rapid rate. By the middle of March the total was approaching 50,000 s.tons. These accumulations do not include nickel in the U.S. Government stockpile or unconsumed nickel in the inventories of consumers. In view of excessive current accumulations by the U.S. Government, deliveries of nickel by the company to the U.S. stockpile previously scheduled for 1958 have been rescheduled for 1959.

Under all these circumstances a 10 per cent cutback in the company's production is regarded as the minimum required at the present time. The large stocks of nickel available to industry in the hands of both the company and the U.S. Government are expected to continue to climb. It has been stated that, unless business in Canada and the U.S. shows a quick upturn, a further cutback by Inco may therefore become necessary.

This abrupt reversal of the supply-demand for nickel is attributed primarily to increased production, reduction of defence and stockpiling requirements, and the slackening of general industrial activity in North America, the duration of which cannot at this time be forecast. If the "major world recession", to recall Dr. Thompson's words, has not yet materialized—and most authorities are confident that it can yet be averted—the economic barometer has certainly changed very drastically since October. An important factor, so far as nickel is concerned, is the suddenness of the change. Civilian industry, accustomed for eight years to thinking in terms of inadequate supplies of nickel, has not had sufficient time to adjust itself to conditions of plentiful supply.

Some nickel producers have a certain amount of protection up to 1961 against the consequences of temporary over-production in the form of "puts" clauses in incentive clauses, total "puts" rights for nickel amounting to 12,000 s.tons, all of which represents high-cost metal produced under premium price contracts. Inco itself has no protection of this nature, but would doubtless benefit indirectly from the removal of a certain amount of marginal material from the market under "puts" rights of other producers.

The long-term outlook for nickel is still regarded as excellent. As Inco's annual report points out, during the years of shortage for civilian purposes, nickel demonstrated that its many properties fit into the pattern of modern technology. The company remains convinced that there will be a long future of upward trend in nickel consumption. This faith is clearly demonstrated by the determination with which Inco is pushing ahead with the development of its great new source of nickel supply in Manitoba, which will come into production in 1960 as scheduled.

Meanwhile Inco's nickel production capacity at Sudbury has risen to fully 150,000 s.tons per year and full production can at any time be resumed with a minimum of delay. Thus there is no danger that the announced cutback will lead to temporary scarcity when consumption resumes its upward trend.

CANADIAN MANGANESE VENTURE

Negotiations are being continued by Strategic Manganese Corporation for finance to construct its large-scale manganese mining and smelting operation at Woodstock, New Brunswick (*The Mining Journal*, August 23, 1957, page 226). Extensive test work conducted at the prototype smelter of Strategic-Udy-Metallurgical and Chemical Processes in Niagara Falls, Ontario, was completed a few weeks ago. It is reported that the electro-metallurgical process developed has been demonstrated to be feasible and profitable on a commercial basis.

★
Last year Brazil became the world's leading exporter of manganese ore with a total of 820,000 tonnes, of which the U.S. bought 400,000 tonnes for stockpiling. It is not expected that this year's production will exceed 600,000 tonnes, and purchases by the U.S. authorities are expected to be only 75,000 tonnes.

★
Japanese ferro-manganese manufacturers have announced their decision to decline an Indian offer to export about 50,000 tons of manganese ore to Japan. The State Trading Corporation of India had previously requested the Japanese makers to buy up to this quantity of ore for shipment from March to August. India, it was stated, had insisted on export prices of \$U.S.43 per ton f.o.b. Indian ports for 44-46 per cent ore, and

\$U.S.52 for 46-48 per cent ore, which prices were regarded as far too high.

There has been no progress in negotiations between Japan and the U.S.S.R. for the import of manganese ore, since the Soviet Union offered 20,000 tons of ore at \$65 per ton c.i.f. Japan, for shipment from February to June, and Japan bid \$45.

Japan's output of manganese products during the whole of 1957 totalled 191,488 tons, which compares with 193,079 tons during the 1956-57 financial year (April to March).

DUTY ON ANTIMONY RAISED

The British Treasury has raised the import duties payable on antimony metal and oxides and on certain antimony alloys and mixtures containing antimony oxides to 25 per cent or £40 per ton, whichever is the greater. The order operates from today, March 21. Previously, import duties were 10 per cent; except on oxides classed as pigment, which were liable to duty of 20 per cent.

The question of a higher duty has been under consideration for a considerable time, following representations from British interests. In fact, the Board of Trade announced as far back as October, 1956, that an application for increased protective duties on antimony was being considered.

Foreign metal of 99.6 per cent purity was recently indicated at about £158 per ton c.i.f., excluding the old duty of 10 per cent. With the new 25 per cent tariff and on a delivered U.K. basis, it will be at almost the same price as U.K. 99.6 per cent, which is priced at £197 10s. per ton.

Even though the quantity of foreign antimony entering the U.K. is probably not more than 50 tons a month, the opinion has been expressed that foreign producers might lower their prices in order to get in under the new duty. Chinese antimony is said to be going chiefly to Canada.

RESEARCH ON RARE EARTHS

More than half a dozen U.S. companies interested in the rare earths are expected to announce very shortly the formation of a special organization which will probably be interested in various research projects, market development, and the dissemination of information about the rare earths, thorium and their chemicals.

A comprehensive survey covering ten years of literature in the U.S. and other countries on the metallurgical applications, both ferrous and non-ferrous, of the rare earths, has been produced by the Davison Chemical division of W. R. Grace and Company, of Pompton Plains, N.J. Davison is a major processor of monazite sand, and produces mixed rare-earth oxides and salts, purified rare earths, and various specialty rare-earth products.

PHILIPPINE CHROME EXPORTS

The Philippine producer, Liberty Chromite Mining Corporation, operating chromite mines in Palawan, Samar, and Zambales, has made a shipment of metallurgical chromite to Holland. Shipments of refractory and metallurgical ore to the U.S. and Canada will be made in the near future, following the conclusion of

negotiations with several buyers in these countries.

Besides producing refractory and metallurgical chromite, this company is also undertaking the geological study and diamond-drilling of several manganese deposits in Palawan. Production of high-grade manganese is expected to be started by the middle of this year.

COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

The firmer undertone in the copper market, which was mentioned last week, became more apparent over the last seven days and prices have firmed up considerably, although at the time of writing they are under the best. The undertone for both lead and zinc has been better but the tin market is still unsettled by offerings of nearby metal, some of which has had to be absorbed by the buffer pool.

It is also interesting to note that the over-production in the four metals dealt in on the London Metal Exchange has now been followed by a surplus of aluminium and nickel, and producers of both these metals have recently announced cuts, that in nickel also affecting copper production as the latter metal appears as what might be termed a by-product in the operations carried on in Canada.

EUROPEAN COPPER PRICES FIRMER

The major events in the copper market this week have been the publication of the statistics for February, the sharp rise

on the L.M.E. early in the week, and the large turnovers on Comex. The February statistics were not as bad as some people in this country expected, but were quite bad enough, as in spite of all curtailments the average daily rate of production throughout the world was higher than in January.

In the U.S., domestic deliveries during the month totalled only 93,784 s.tons against 110,557 s.tons for January, and the stocks at the end of the month totalled 201,223 s.tons against 176,287 s.tons a month earlier. Outside the U.S. the picture was a little better, as although the monthly deliveries fell by almost 20,000 s.tons, stocks at the end of February showed a decrease of about 3,500.

It is apparent from the figures that consumers in the States are not only running down their stocks but are definitely booking fewer orders, whilst in Europe consumption and the metal available at present price levels is in approximate balance. As we have said before, should the demand in Europe exceed availability

of metal, then the L.M.E. quotation will have to rise to such a figure that shipment eastwards across the Atlantic becomes a paying proposition.

On the market itself the sharp rise at the beginning of the week was helped by a technically short position which resulted in a backwardation being established on Tuesday. During the afternoon of that day prices fell steeply but, owing to a good demand from Europe and an over-sold position on the market, were followed on Wednesday by an appreciable recovery. There is no doubt that in Europe there is a shortage of wire bars and premiums of up to £12 per ton have been paid for metal for delivery before the end of April.

BUFFER STOCK v. U.S. SLUMP

The tin market has been relatively featureless, although prices have tended to drift lower, and it is believed that a small tonnage of cash metal has been bought by the buffer stock manager. The overall position, however, is one which indicates higher prices in the near future, as it is reported that during the first half of March only 446 t.ons were exported from Singapore as against 813 tons during the first half of February, and from Penang, exports totalled 1,158 tons compared with 1,798 tons during the first half of February.

The main depressing factor at the moment is the situation in America where steel production is still running at a very low level and there are no signs of any improvement in the automobile industry. On Thursday morning the Eastern price was equivalent to £748½ per ton c.i.f. Europe.

LONDON METAL AND ORE PRICES, MAR. 20, 1958

METAL PRICES

Aluminium, 99.5%, £197 per ton	Iridium, £26 oz. nom.
Antimony—	Lanthanum (98/99%) 15s. per gram.
English (99%) delivered, 10 cwt. and over £190 per ton	Manganese Metal (96% - 98%) £310
Crude (70%) £190 per ton	Magnesium, 2s. 5½d. lb.
Ore (60%) basis 1½s. 6d./20s. 6d. nom. per unit, c.i.f.	Nickel, 99.5% (home trade) £600 per ton
Arsenic, £400 per ton	Osmium, £20/£22 oz.
Bismuth (min. 1 ton lots) 16s. lb. nom.	Osmiridium, nom.
Cadmium 10s. 0d. lb.	Palladium, £7 10s. oz.
Cerium (99% net), £13 18s. lb. delivered U.K.	Platinum U.K. and Empire Refined £27 10s. oz.
Chromium, Cr. 99% 7s. 2d. lb.	Imported £24/£24 10s.
Cobalt, 16s. lb.	Quicksilver, £77/£78 ex-warehouse nom.
Germanium, 99.99%, Ge. kilo lots 2s. 8d. per gram	Rhodium, £40/£42 oz.
Gold, 249s. 3d.	Ruthenium, £15/£18 oz. nom.
	Selenium, 50s. 0d. per lb.
	Silver, 76d. f. oz. spot and 75½d. f.d.
	Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth	65s. 8s. 6d. lb. c.i.f.
Chrome Ore—	18/20% 1s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semifriable) 48%	£17 5s. 0d. per ton c.i.f.
Hard Lumpy 45%	£18 0s. 0d. per ton c.i.f.
Refractory 40%	£12 5s. 0d. per ton c.i.f.
Smalls 44%	£16 5s. 0d. per ton c.i.f.
Baluchistan 48%	£12 0s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade	nom.
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF ₂)	156s. 0d. ex works
Lithium Ore—	
Petalite min. 3½% Li ₂ O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Lepidolite min. 3½% Li ₂ O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Amblygonite basis 7% Li ₂ O	£26 5s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Manganese Ore Indian—	
Europe (46% - 48%) basis 77s. 6d. freight	nom.
Manganese Ore (43% - 45%)	nom.
Manganese Ore (38% - 40%)	nom.
Molybdenite (85% basis)	8s. 5d. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO ₂ (prompt delivery)	£39/£40 per ton c.i.f. Aust'n.
Ilmenite 52/54% TiO ₂	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	95s. 0d./100s. 0d. per unit c.i.f.
Vanadium—	
Fused oxide 90 - 95% V ₂ O ₅	£10 per unit c.i.f.
Zircon Sand (Australian) (65 - 66% ZrO ₂)	£16 per ton c.i.f.

COPPER HELPS LEAD AND ZINC?

Both the lead and zinc markets have shown a better undertone but many operators attribute this to the strength of the copper market rather than to increased demand. The shadow of a possible alteration in the U.S. tariffs is also having its effect, as it is rumoured that the Tariff Commission's recommendations will be available before Easter. In any case, however, the present price level in lead has tended to curtail shipments westwards across the Atlantic and the zinc market is continually affected by offerings of Russian zinc. It is interesting to note that sellers from behind the Iron Curtain are basing their sales strictly on the L.M.E. quotations and there have been no signs of price cutting, as is the case in the aluminium market.

Closing prices and turnovers are:

	Mar. 13		Mar. 20	
	Buyers	Sellers	Buyers	Sellers
COPPER				
Cash	£164½	£165	£174½	£174½
Three months ..	£167	£167½	£174½	£174½
Settlement ..		£165		£174½
Week's turnover	8,925 tons		11,050 tons	
LEAD				
Current ¼ month	£74½	£74½	£75½	£76
Three months ..	£74½	£74½	£75½	£75½
Week's turnover	5,375 tons		3,775 tons	
TIN				
Cash	£731	£731½	£730	£730½
Three months ..	£736	£737	£733	£734
Settlement ..		£731½		£730½
Week's turnover	1,690 tons		1,220 tons	
ZINC				
Current ¼ month	£62½	£63	£64	£64½
Three months ..	£63½	£63½	£64½	£64½
Week's turnover	4,725 tons		4,600 tons	

Mining Finance

Inco's Calculated Risk

The International Nickel Co. of Canada's full report and accounts for 1957 is a document worthy of study.

The date of the report, March 3, 1958, is significant for by that time the company knew that its long eight-year honeymoon was over and that the somewhat novel experience of getting down to the business of selling its products in a market governed exclusively by technical and economic considerations had become the order of the day.

Although change is always sudden, its impact is gradual, and this has given the company time to plan for intensified selling activities and stepping up its research and promotional projects designed to develop larger markets for nickel and its alloys. On this aspect of the company's plan depends whether or not the price of nickel will have to be lowered. If this should happen the repercussion on revenue and profits will be marked. On evidence available the prospects of holding the price line cannot be considered too bright. Stocks of nickel in the hands of consumers are at record high levels and with increased world nickel production anticipated this year demand will have to show a remarkable increase over present levels to absorb the tonnages available.

Production cutbacks can be considered as an alternative to price reduction but the ultimate result on revenue and profits must be the same. In this connection the Inco accounts must be viewed with the 10 per cent cut in production announced earlier this week in mind.

Confidence is a wonderful and essential attribute for any producer of commodities and this Inco has in large measure. In 1958 the company is anticipating capital expenditure of some \$60,000,000-\$70,000,000, a large proportion of which will be absorbed by the development of its new nickel project in Manitoba which will be the second largest source of nickel in the world. This may appear like "whistling hard" but the calculated risk taken here is that economic conditions will have radically altered by 1961 when demand may well bear out the chairman's prognosis that the long-term outlook for nickel is excellent, that it will have an even greater economic value than in the past, and that there will be a long future of upward trend in nickel consumption. Meanwhile, caution must be the keynote.

While the future outlook throws up a number of nice problems, the company can look over its shoulder at last year's accounts with a sense of triumph. Indeed, in spite of a marked decline in the copper price and reduced production sales and prices for its platinum the company's net earnings of \$86,141,000, equivalent to \$5.90 per common share, were the third highest in Inco's history. It is perhaps unfortunate they suffer by comparison with 1956, the company's record year, when net earnings were some 10 per cent higher at \$96,296,000, equivalent to \$6.50 per common share. Nevertheless, the company maintained its dividend distribution in 1957 at \$3.75 per common share.

BANK RATE DOWN 1 PER CENT

The Bank Rate was lowered yesterday by 1 per cent to 6 per cent, the first change since it was advanced to 7 per cent on September 19, 1957.

Although it was expected that any change in Bank Rate would be downwards, the decision to lower it now and by a full 1 per cent came as a surprise, albeit a welcome one and industrials made a general advance.

COMMANDER GRENFELL DOES IT AGAIN

Commander H. F. P. Grenfell, chairman of Messina (Transvaal) Development Company, seems to specialize in dropping bombshells. Last week he surprised everybody by revealing that the Mangula mine was still making a profit, albeit marginal, at the £160 copper price level. Now Commander Grenfell, in his speech to shareholders of Messina at the annual meeting in Salisbury on Wednesday, was able to announce the equally remarkable news that the Messina mine, too, was profitable at present prices.

The explanation for this achievement once again lies in advanced technique. At Mangula this was chiefly evidenced by the success of the novel Aerofall mill; at Messina lower costs have been made possible by the use of such features as electronic control of mill equipment.

Apart from this news Commander Grenfell has little new information to reveal, and the picture of operations at Messina's other widespread interests is no more advanced than at the date of the annual report. To recapitulate on the three major prospects: the scheelite deposit at Beardmore is ready for production to be started up at short notice; exploration at the Alaska copper prospect has so far borne out the hopes expressed last year by Commander Grenfell; and diamond drilling at Sanyati has brought ore reserves to over 15,000,000 tons containing 1.4 per cent copper, 1.35 per cent lead and 2.85 per cent zinc.

Commander Grenfell's address appears on page 334.

R. BROKEN HILL PRELIMINARIES

All things (and especially the decline in base metal prices) considered, the preliminary results for 1957 announced by Rhodesia Broken Hill are not at all disappointing. In fact, they are better than many had anticipated.

Actual operating profits were down by £600,000, from £1,952,745 to £1,259,219, but in the case of this company, taxation has provided a very useful cushion indeed, absorbing almost half of the drop in profits by falling from £610,000 to £350,000. There is also a fairly large non-recurring item this year resulting from the sale of the Iron Duke Mine, which netted £66,000. Capital expenditure continues to take a large slice of earnings

(the appropriation this year was £450,000) but there is no way of telling whether the end of the company's schemes is in sight. For this reason the annual report is awaited with no little interest, for should Rhodesia Broken Hill complete its capital programme at or about the same time as a resurgence in base metal demand, the company will be in an enviable position. For the time being it must suffice that the final dividend of 7d. recommended reduces the year's total by only 4d. from the 1s. 3d. declared in 1956 (all net of Rhodesian tax).

The meeting is to be held in Salisbury on May 15.

UNION CORPORATION MAINTAINS DIVIDEND

In spite of a drop in profits from £2,093,334 in 1956 to £1,578,431 in the year to December 31 last, Union Corporation is maintaining the annual dividend rate at 3s. per share by declaring a final payment of 2s. To achieve this the company has put only £350,000 to general reserve, a reduction from £1,000,000 in the previous year.

One feature of the preliminary figures, inexplicable until the full report appears, is the fact that the amount appropriated for taxation has increased to £664,929 from £556,421 in 1956 notwithstanding the fall in earnings.

RHOANGLO'S REARRANGEMENTS

The only credit item to emerge from Rhodesian Anglo American's brush with the C.I.C. last week is the remarkable way in which the well-oiled Rhoanglo machine swallowed the king-sized spanner thrown into its works with no more than a slight hiccup.

In spite of the C.I.C.'s refusal to permit the whole issue, Rhoanglo's scheme is to go ahead with only minor changes. For applicants outside the U.K., the procedure will be as before. U.K. investors, however, will be able to apply for only £500,000 of loan stock, the amount for which dispensation was granted. The conversion options are also unchanged in practice, for although members on the London Register will only be able to exercise their options by surrendering loan stock, it is probable that this method would have been followed in most cases anyway, since it carries a slight financial advantage.

Application forms were posted to members on March 19, and the offer will remain open until the end of this month.

INCREASED O.F.S. PAYMENTS

Increased dividends were announced this week by the two Orange Free State dividend-payers outside the Anglo American Group. Both were more or less in line with market expectations, although some optimists had hoped for more from St. Helena.

Harmony's payment of 1s. compares with 9d. last September and two distributions of 6d. in the previous year, while the 1s. from St. Helena is 2d. higher than in September last, with 9d. and 7d. for the two preceding half-years.

VOLUME I STOCK EXCHANGE OFFICIAL YEAR BOOK

In every line of business there are always one or two standard works of reference which are essential to have within easy reach. Those interested in commerce and finance in any of its aspects and implications, not the least of which concerns the Stock Exchange, will recognize the need to have by them The Stock Exchange Official Year Book, Volume I and Volume II.

Indeed, these "Bibles" of the City do not require formal introduction apart from the announcement as to when the new issue is available.

Accordingly, the 1958 Edition of Volume I is now on sale.

For the uninitiated, however, it may be noted that Volume I comprises some 1,900 pages and contains full particulars of all securities—including mining companies—quoted on the London and associated Stock Exchanges, except those listed under Commercial and Industrial which form Volume II to be published in September. The price of £8 net covers the two volumes for 1958; by post inland £8 5s.; abroad £8 10s. The publishers are Thomas Skinner and Co. (Publishers) Ltd., Gresham House, Old Broad Street, London, E.C.2.

MARKET HIGHLIGHTS

Highlights in mining markets on the London Stock Exchange were very few and far between in the week to March 19. Base metals were completely dominated by the vagaries of Wall Street and the uncomfortable thought that whatever the chances of President Eisenhower's measures eventually pulling the U.S. economy out of its recession, there was precious little sign of an improvement so far.

Copper shares appeared to be poised in the balance, though rather inclined to harden than to ease. The two main factors in this market were, of course, Wall Street and the metal price. But when the metal price looked firmer, Wall Street turned easier and on the other hand when there was a rally on Wall Street, copper seemed to sag. Consequently, nobody knew whether to buy or sell copper shares and in the circumstances it was thought best to leave the market to its own devices. As a result, share prices remained fairly constant but the immediate outlook for them seemed more obscure than ever.

Lead-zincs fluctuated uncertainly with any general trend that was discernible and Tins lost a few pence when dealers had a chance to operate. Tanjong eased to 12s. 3d. on the decision to defer consideration of the quarterly dividend. Elsewhere, Diamonds also moved with Wall Street, but buyers of De Beers were more concerned with dividend considerations; the unchanged payment that was finally announced disappointed some who had held the record 1957 sales figures in mind.

In the earlier part of the week, Gold shares were looking distinctly dull, the market not being helped by the opinion of Mr. Eugene Black, president of the World Bank, that there would be no increase in the U.S. price of gold. But a firmer tone appeared later following Johannesburg reports that at last something was to be done to help the marginal mines. The firmer tendency gradually gathered strength and though there was no real expansion in business, there was much more confidence felt by Kaffir dealers than was encountered elsewhere in the House.

Consolidated Main Reef (14s. 6d.), City Deep (14s. 3d.) and Durban Deep (29s. 3d.) were among the many shares to show appreciable gains on the marginal mines assistance hope. Van Dyk rose 7½d. to 4s. 3d. on the capital return news.

Otherwise, interest was selective among the newer or relatively high profit-earning mines. West Rand Consolidated, for instance, were steadily acquired by Continental operators and the resultant shortage of stock here caused the price to rise to 26s. 6d. In a rather quiet O.F.S. section, St. Helena (39s. 3d.) came to life on talk of high developments being found in the new shaft area.

Finance issues often improved, particularly Rand Mines (71s. 3d.) and General Mining (83s. 9d.). Union Corporation were an exception on their sharp fall in profits. On the other hand, the market was pleasantly surprised with the useful increase in both profits and dividend announced by the Rhodesian Globe and Phoenix gold mine and the shares soon jumped to 25s. 6d.

Rand & Orange Free State Returns for February

Company	February, 1958			Year ends	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz.)	Profit (£000)		Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)
Goldfields	83	34,507	181.2	J	683	281,884	1575.1	605	241,130	1133.3
Deernfontein	99	22,744	53.0	J	908	183,602	425.7	774	173,666	436.3
Libanon	63	11,486	4.2	J	573	102,497	59.7	652	116,917	77.5
Luipards Vlei	22	5,004	14.2	D	45	10,358	29.2	51	11,404	31.9
Rietfontein	70	14,900	5.3	D	143	30,540	12.6	144	28,984	9.4
Robinson	77	15,932	12.4	D	169	33,278	29.9	188	34,464	32.4
Simmer & Jack	64	15,546	22.8	J	526	133,105	222.4	528	149,320	386.1
Sub Nigel	113	27,855	49.2	J	963	233,247	441.0	987	224,838	526.2
Venterspost	48	16,951	81.9	D	96	34,018	163.6	96	34,055	164.0
Vlakfontein	96	21,811	47.1	D	192	43,725	93.8	198	46,285	117.9
Vogels	75	72,132	584.3	J	600	575,964	4804.8	600	562,385	4624.6
West Drie										
Anglo American										
Brakpan	110	15,336	7.6	D	235	33,483	19.1	208	35,569	19.8
Daggas	209	44,205	226.4	D	426	90,205	463.2	430	95,814	519.0
East Daggas	84	14,006	22.2	D	174	29,006	49.8	186	30,601	62.6
F.S. Geduld	62	45,266	312.2	S	316	225,907	1555.3	236	116,313	541.0
Lorraine	62	11,254	122.2	S	309	59,429	180.1	304	58,140	136.2
President Brand	75	55,323	447.0	S	354	266,145	2135.9	301	231,408	1906.5
President Steyn	90	34,587	182.1	S	460	210,036	1042.7	443	172,058	1000.4
S. A. Lands	81	16,874	46.1	D	167	34,624	96.3	170	37,611	129.9
Springs	119	13,189	5.3	D	245	27,369	14.3	247	28,195	13.2
Vaal Reefs	63	28,352	157.4	D	131	58,717	334.6	110	47,265	272.5
Welkom	81	24,104	65.8	S	403	119,467	320.7	427	106,134	227.9
Western Holdings	91	49,940	355.2	S	478	248,857	1811.9	441	196,908	1277.2
West Reef Ex.	106	24,649	50.2	D	215	49,993	107.7	239	51,480	119.4
Central Mining										
Blyvoor	99	57,603	401.2	J	819	484,091	3432.4	836	471,249	3429.7
City Deep	137	26,112	9.1	D	285	54,160	19.2	297	58,164	35.6
Cons. M.R.	124	20,344	10.2	J	1,294	179,657	78.6	1,304	182,893	71.4
Croon	209	22,623	15.1	D	440	68,227	32.3	483	70,749	114.0
D. Roodepoort	165	39,866	43.4	D	350	63,002	97.9	358	62,642	101.2
East Rand Prop.	202	52,512	129.4	D	427	109,533	285.0	406	107,270	314.9
Harmony	73	29,959	133.7	J	644	528,496	1272.4	618	211,993	1256.8
Modder East	121	12,327	1.1	J	1,087	109,781	21.5	1,104	113,855	11.0
Rose Deep	53	7,445	5.0	D	109	15,290	8.2	95	14,854	0.3
J.C.I.*										
E. Champ d'Or	12	304	124.9	D	24	589	153.1	23	641	149.4
Freddies Cons.	47	15,510	119.4	D	92	31,194	136.9	107	26,748	155.5
Govt. G.M.A.	60	10,727	1.2	D	125	22,119	2.5	284	43,685	153.6
Randfontein	24	4,169	5.0	D	203	8,266	10.1	—	—	—
Union										
East Geduld	115	35,364	232.5	D	242	74,417	499.2	268	82,599	574.1
Geduld Prop.	77	12,144	8.9	D	163	25,764	20.3	205	32,482	51.4
Grootvlei	180	38,426	194.4	D	375	79,970	405.9	377	80,806	421.7
Marievale	66	17,392	76.2	D	139	36,558	160.6	139	36,588	162.9
St. Helena	108	32,244	173.3	D	226	66,940	360.0	230	67,239	367.8
Van Dyk	71	12,580	18.1	D	148	26,172	38.3	154	25,371	5.3
General Mining										
Buffelsfontein	106	35,182	175.0	J	876	286,556	1517.3	167	45,225	142.5
Ellaton	30	6,831	28.0	D	62	14,125	66.0	63	13,306	29.3
S. Roodepoort	27	6,460	23.1	J	235	55,282	201.0	231	53,946	196.7
Stifffontein	107	53,125	371.2	D	215	106,787	746.4	184	78,194	486.0
W. Rand Cons.	118	17,425	11.0	D	225	31,758	16.9	272	37,746	9.6
Anglo-Transvaal										
Hartebeestfontein	80	44,000	292.5	J	679	372,615	2512.6	680	289,378	1749.7
N. Klerksdorp	11	1,045	18.1	D	20	1,913	116.4	20	2,411	110.4
Rand Leases	150	22,725	1.2	J	1,360	206,506	64.6	1,248	194,074	1176.3
Village M.R.	27	4,581	2.0	J	258	42,085	40.2	264	41,752	67.3
Virginia O.F.S.	98	25,480	39.5	J	808	197,668	485.2	731	161,155	459.1
Others										
N. Kleinfontein	86	10,645	0.5	D	180	22,185	1.0	190	21,600	29.3
Wit. Nigel	17	4,255	0.6	J	142	34,101	38.7	144	31,886	63.0

Gold has been valued at 248s. 6d. (January 248s. 4d.) per oz. fine. L indicates loss. *Working Profit. *Working Profit includes sundry revenue. Table excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipards Vlei, Randfontein and W. Rand Consolidated.

THE MESSINA (TRANSVAAL) DEVELOPMENT COMPANY, LIMITED

(Incorporated in the Union of South Africa)

EFFECT OF FALL IN COPPER PRICES

CONFIDENCE IN LONG-TERM PROSPECTS UNCHANGED

CORRECTNESS OF CAPITAL EXPENDITURE PROGRAMME

SOUTHERN RHODESIA: EXCELLENT PROGRESS AT MANGULA MINE

COMMANDER H. F. P. GRENFELL'S REVIEW OF ACTIVITIES

The Eighth Annual General Meeting of Stockholders of The Messina (Transvaal) Development Company, Limited, was held in Johannesburg on March 19, 1958. **Commander H. F. P. Grenfell, D.S.C., R.N. (Ret'd.)**, presiding.

The Chairman addressed the meeting as follows:
Ladies and Gentlemen,

It gives me great pleasure to welcome you to the Eighth Annual General Meeting of your Company and, on behalf of the Board of Directors, to present for your approval their Report and the audited Accounts of your Company for the financial year ended September 30, 1957. They have been in your hands for some time and following our usual practice I propose, with your approval to take them as read.

Tribute to Mr. A. B. Emery

Before giving you my review of the past year's operations, I have to report with deep regret the death on July 26 last year of our colleague on the Board, Mr. A. B. Emery.

Those of you who have been Members for many years will already know of his outstanding services to the Company, but I think it right to take this opportunity of bringing them to your notice again.

Mr. Emery was appointed General Manager in 1914 and served the Company in that capacity for thirty-three years. At the end of 1947 he was made a Director and appointed Consulting Engineer, and three years later became Deputy Chairman—a position he held until the day of his death.

His great technical experience and wise counsel were as invaluable on the Board as they had been during his period of office as General Manager and we have all suffered a severe loss by his death.

Those of you who read my speech last year will have been prepared to some extent for a lower level of copper prices and consequently for a reduced operating profit for the year. In the event, as you will have seen from the Accounts, our revenue from the sale of copper fell by about £700,000. The net working profit for the Group, after providing for taxation and all normal outgoings, decreased by £634,000 and amounted to £1,159,674. Adding a Capital profit of £422,558 derived from the sale of our Bukwe and Belingwe assets and the unappropriated balance of £29,807 brought forward from last year, and deducting a loss of £8,359 on the realization of certain investments, the total available was £1,603,680.

Of this amount £726,000 was distributed in dividends, £444,072 was transferred to Capital Reserve, and in view of our commitments in Southern Rhodesia a further £400,000 was put to General Reserve. This leaves a balance of £33,608 to be carried forward to next year.

Further Substantial Decline

In the course of the year the price of copper fell from £295 to £195 per ton and since then there has been a further

substantial drop. On February 13 it was quoted at £160 10s., which is the lowest level since 1950.

Had this price persisted for any length of time few companies would have been able to make much more than a nominal profit in relation to the capital employed, while high cost producers might have suffered substantial losses.

I am glad to be able to reassure you today by telling you that our costs are such that we are still able to operate at a profit—moderate though this may be.

This can be largely attributed to the various measures designed to improve operating efficiency which we have introduced during the past ten years. They have involved considerable capital expenditure but our position today proves beyond doubt the correctness of our policy.

Nevertheless we are going through a difficult period and it is clearly best to face up to the situation and take such further action as is open to us to effect suitable economies as a precaution against either a further deterioration in the price or a prolonged period at the present level.

It is an interesting fact that the present recession in copper prices has occurred at a time when world consumption of copper outside the United States of America has reached an all-time record figure. It is true that world production has also risen but on analysis it seems likely that if consumption had not fallen off in the United States the overall figures of consumption and production throughout the world would probably have been roughly in balance.

Long-Term Prospects Unchanged

Copper still remains one of the essential metals and it would surely be unrealistic to assume that the present situation in the United States will be a permanent feature of the world's economy.

All this leads me to the view that the long-term prospects for copper and therefore for your Company are unchanged and in spite of our present difficulties I look forward to the future with confidence.

Operations at Messina and Umkondo

During the year operations at Messina proceeded normally the average tonnage of ore produced monthly being 76,300 as compared with an average of just over 70,000 tons for the previous twelve months while operating costs fell by 6d. to 36s. 6d. per ton of ore produced. Although this was in part due to the increased output, great credit is nevertheless due to our Resident Manager, Mr. Spence, and his Staff for reversing the recent trend. You will see from the details in the Summary of the General Manager's Report that a lower grade of ore was treated which had the effect of increasing the cost of refined copper to £130 per long ton.

At the end of the year the ore reserves

showed little change in spite of the fact that the tonnage hoisted again showed an increase over the previous year.

At Umkondo on the other hand we have thought it wise, in view of the fall in copper prices, temporarily to reclassify the ore reserves into two categories—"Proved and Probable" and "Possible". All ore which cannot at present be mined profitably but which under more normal conditions would be payable, has been classed as "Possible" and excluded from this year's total which, as a result, shows a fall as compared with last year.

At Messina both the concentrator and smelter plants operated very satisfactorily over the year. A considerable improvement in results was obtained in the Mill by the introduction of electronic control equipment while, as forecast last year, the smelter had a record year and produced 14,723 tons of copper which is the highest figure we have ever achieved.

Interests in Southern Rhodesia

Turning now to our interests in Southern Rhodesia, I must bring to your notice the substantial decrease in operating costs of just over 10s. per ton of ore produced at Umkondo. Although this result was mainly achieved by increased production from the Mine it was carried out without any increase in personnel and the Resident Manager, Mr. Chandler, and his Staff deserve our congratulations and thanks.

With the exception of Mangula with which I will deal later there is not much to tell you this year about our other properties in Southern Rhodesia.

We have discontinued all work at our scheelite deposit at Beardmore pending a recovery in the price of tungsten which fell heavily during the year, and the property is now on a caretaking basis. The surface construction programme had however already been nearly completed and shaft sinking operations were well advanced so that it should not take long to get into production once we decide to resume operations.

At Alaska we continued exploration on the surface by geophysical, geochemical and other methods and, so far, results obtained confirm the opinion I expressed last year that this property will prove to be a profitable asset.

At Sanyati further diamond drilling has indicated that our estimation of ore reserves can be increased to a total of just over 15 million tons containing 1.4% copper, 1.35% lead and 2.85% zinc.

The next stage in our exploration programme will be carried out underground following which we shall be in a position to make definite plans for bringing the property into production. Members will however appreciate that as considerable capital expenditure will be involved the decision to go ahead both here and at Alaska will largely depend on the state of the metal markets at the time.

During the year we also carried out a certain amount of exploration work on other prospects and examined many properties brought to our notice. Details of

those in which we are still interested will be found in the General Manager's Report.

Excellent Progress at Mangula

I come now to Mangula where I am glad to report that excellent progress was made during the year on the surface construction and underground pre-production programmes. So much so that we began railing concentrates for shipment and subsequent treatment at refineries in Europe at the beginning of October last year. Since then—apart from teething troubles which are always to be expected with new equipment—the Mine has settled down well on a production basis.

Full details of operations at Mangula are given in a special section at the end of the Annual Report and Accounts and also in the Offer for Sale document recently sent to all Members, so I do not propose to devote further time to them today. It will be sufficient if I bring to your notice the salient features which are as follows:

First, the increased ore reserves in the Molly section which in round figures now total over 25,000,000 short tons estimated to contain nearly 350,000 tons of copper; second, as I have already mentioned, the fact that we are already receiving revenue from the sale of our concentrates; and third, that we expect to complete the installation of additional units in the mill and flotation plants by the first quarter of 1959 when output will be roughly doubled and operating costs substantially reduced.

I am sure you will be glad to hear that even at our present rate of production and at the current level of prices, revenue receivable from the sale of concentrates

is sufficient to meet operating expenses.

I have made a number of visits to Mangula during the past twelve months and on each occasion I was greatly impressed by the keenness evident in all sections. The community is a particularly happy one, the organization is efficient and I am confident that under the able and energetic leadership of Mr. Wilson, the Resident Manager, and his senior Staff, Mangula will develop into a most successful Mine.

The Issued Capital of the Company is now £4,500,000 and the 5s. stock units are quoted on the Rhodesian, London and Johannesburg Stock Exchanges. Following the Offer for Sale your Company's holding is now approximately 80% of the Issued Capital and I have no doubt that once the price of copper recovers, the stock units will prove to be a profitable investment.

Tribute to Staff and Employees

This brings me to the end of my review and it only remains for me to express on behalf of the Board and myself—and I am sure all Members of the Company—our thanks to the General Manager, Mr. Frost, and to all our Staff and Employees, wherever they may be, for their loyalty and hard work during the past year.

The Directors' Report and Balance Sheet and Accounts for the year ended September 30, 1957, were adopted.

The retiring Director, Mr. P. U. Rissik, was re-elected and the remuneration of the Auditors for the past year's audit was fixed.

There being no further business the Chairman declared the meeting at an end.

Publications Received

British Ropes Ltd. have recently produced Publication No. 113, *Mining Rope Calculations*.

Information Bulletin No. 23, *Soldering Aluminium*, is the latest in the Aluminium Development Association's series on the methods of joining aluminium and its alloys. Available from the Association at 33 Grosvenor Street, London, W.1. Price two shillings.

The second edition of the British Standard for cotton belting ducks (B.S. 1069:1957) adds two standard constructions to the range of cotton belting ducks specified in the first edition.

COLONIAL OFFICE

SENIOR SCIENTIFIC OFFICER

Three pensionable posts at Tolworth, Surrey, in the Photogeological Section of the Directorate of Overseas Geological Surveys for men. Age, normally at least 26 on December 31, 1958. Qualifications, normally degree in Geology or Mining Geology and three years' post-graduate or similar experience. Experience in geological mapping and photogeological technique essential. Salary £1,190 to £1,410. Promotion prospects. Write Civil Service Commission, 30 Old Burlington Street, London, W.1. for application form quoting No. S4824 58. Closing date: April 10, 1958.



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Mining Engineer

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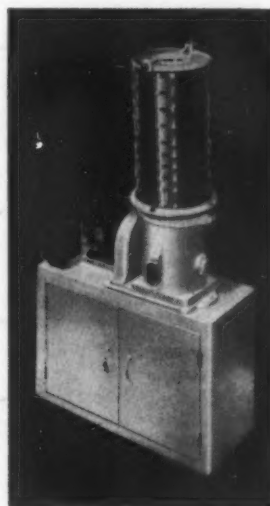
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